IGNORING HISTORY: THE FLAWED EFFORT TO DIVORCE RECONNAISSANCE FROM SECURITY IN MODERN CAVALRY TRANSFORMATION

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The challenges of modernization for any military in the contemporary operating environment are difficult with even the most professional and well-financed of militaries. Not only are the costs of research and development prohibitive in attempting to address the entire spectrum of evolving threats, but the consequences of making the wrong decisions can betray the US Army its most precious commodity; the lives of its soldiers. This study examines the current US Army efforts at cavalry transformation and some of the assumptions supporting this transformation. This study questions whether any recent historical examples in maneuver warfare actually support the logic behind the recent decisions to radically alter the role of cavalry. This study poses the central question: Are the new reconnaissance squadrons adequately equipped or organized to answer the needs of the new modular brigade combat teams? This thesis examines what some of the most significant examples of mechanized cavalry operations over the last sixty-five years demonstrate regarding the fundamental linkages between reconnaissance and security in modern maneuver warfare. Exposing the flawed assumptions imbedded in current transformation efforts is a worthy exercise, as is also the consideration of how to best adjust these new reconnaissance squadrons to make them more capable.

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ABSTRACT

IGNORING HISTORY: THE FLAWED EFFORT TO DIVORCE RECONNAISSANCE FROM SECURITY IN MODERN CAVALRY TRANSFORMATION, by MAJ Matthew A. Dooley, US ARMY, 108 pages.

The challenges of modernization for any military in the contemporary operating environment are difficult with even the most professional and well-financed of militaries. Not only are the costs of research and development prohibitive in attempting to address the entire spectrum of evolving threats, but the consequences of making the wrong decisions can betray the US Army its most precious commodity; the lives of its soldiers. This study examines the current US Army efforts at cavalry transformation and some of the assumptions supporting this transformation. This study questions whether any recent historical examples in maneuver warfare actually support the logic behind the recent decisions to radically alter the role of cavalry. This study poses the central question: Are the new reconnaissance squadrons adequately equipped or organized to answer the needs of the new modular brigade combat teams? This thesis examines what some of the most significant examples of mechanized cavalry operations over the last sixty-five years demonstrate regarding the fundamental linkages between reconnaissance and security in modern maneuver warfare. Exposing some of the flawed assumptions imbedded in current transformation efforts is a worthy exercise, as is also the consideration of how to best adjust these new reconnaissance squadrons to make them more capable.

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ACRONYMS

ACAV	Armored Cavalry Vehicle
ACR	Armored Cavalry Regiment
ARVN	Army of the Republic of Vietnam
BCT	Brigade Combat Team
BFSB	Battlefield Surveillance Brigade
BLOS	Beyond Line of Sight
BRT	Brigade Reconnaissance Troop
BTB	Brigade Troops Battalion
CAB	Combined Arms Battalion
CLC	Cavalry Leaders Course
COE	Contemporary Operating Environment
EMP	Electromagnetic Pulse
ES2	Every Soldier a Sensor
FCS	Future Combat System
GHQ	General Headquarters
GSR	Ground Surveillance Radar
HBCT	Heavy Brigade Combat Team
HMMWV	High Mobility, Multipurpose, Wheeled Vehicle
HUMINT	Human Intelligence
IBCT	Infantry Brigade Combat Team
IED	Improvised Explosive Device
ISR	Intelligence, Surveillance, and Reconnaissance
MACOV	Mechanized and Armor Combat Operations In Vietnam

METL	Mission Essential Task List
MTOE	Modified Table of Organization and Equipment
NCW	Network Centric Warfare
NLOS	Near Line of Sight
NVA	North Vietnamese Army
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
REMBASS	Remote Battlefield Sensor System
RPG	Rocket Propelled Grenade
RSTA	Reconnaissance, Surveillance, and Target Acquisition
SBCT	Stryker Brigade Combat Team
SDKFZ	Sonderkraftfahrtzeug
SRO	Stability and Reconstruction Operations
TAC-P	Tactical Air Control Party
TRADOC	Training and Doctrine Command
UAV	Unmanned Aerial Vehicle
VC	Vietcong

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CHAPTER 1

INTRODUCTION

In 2002, the United States Army released the white paper, *Concepts for the Objective Force*, that codified most of the coming changes toward modularity. Since then the US Army has embarked upon one of the most ambitious attempts at rapid transformation ever witnessed in its 231 year history. As the US Army attempts to leap toward what *On Point* calls "Third Wave" or "Network Centric Warfare," nearly every organization, doctrinal manual, warfighting concept, operational assumption, and cultural habit is open to question.[1] Aggravating the difficulties inherent with a tectonic shift of this magnitude, this current shake-up in military affairs is also taking place amidst the uncertainty of a nation at war. Because of the seriousness of the times and the lives and assets at stake, the consequences of any failure to transform properly will be significant.

Under the new force modularity concepts, the most recent transformation plans call for every brigade, division, and corps to undergo radical modification by 2007, to better enable us to fight the wars of the future. By 2014, the US Army predicts at least one operational maneuver brigade will be entirely equipped and trained as a Future Combat System (FCS) Brigade. For many wearing the uniform today, the dizzying array of changes, both those already in place and those planned for the near future seem more than a little confusing. Final versions of the new brigade combat team doctrine field manuals governing the employment of these new modular organizations have yet to be approved, and few of the new future ground systems or concepts have seen much operational testing. Compounding this problem are the numerous recent modifications

and variations on the theme that transforming brigades and battalions out in the active force must make every day when confronted with the absence of the required equipment and personnel projected to occupy these newly transformed organizations.

These changes also impact the cavalry force. Since 2000, every cavalry field manual in the Army has undergone multiple updates, complete draft rewrites or even consolidation into other field manuals. In an effort to provide some sort of cogent azimuth, the US Army has presently codified the only core competency of cavalry now as strictly reconnaissance, stripping the old organizations of much of their firepower and renaming all of them reconnaissance squadrons.[2] Training and doctrine proponents have raced to keep up with the rapid pace of adjustments to numerous intelligence, surveillance, and reconnaissance (ISR) procedures. Few in the US Army have avoided the effects of these changes, and traditional cavalry organizations themselves have certainly not been spared this reexamination. Whether changes continue merely in the organization of cavalry units or ultimately redefine every one of the fundamental doctrinal concepts behind reconnaissance and security, very little anywhere in the cavalry community is being left unquestioned.

Logic suggests that prior to instituting any of the proposed changes to cavalry, the US Army should first demonstrate that these new organizations, equipment, and doctrine perform better than what currently exists. The Future Force and Future Combat System concepts all have promised exactly that by emphasizing one thing: the Quality of Firsts. The official concept proposes the following: seeing first by making sensor contact out of direct fire contact, understanding and acting first to shape the fight out of main force contact, and ultimately finishing decisively at the time and place of our choosing. [3] All of

these innovative new technologies will together eliminate the need to fight for information. With no need to fight for information in the traditional sense, at least in theory, there will therefore be no need to carry the enormous weight, firepower, and quantity of ground combat systems the US Army currently requires to perform traditional cavalry missions. Fewer, lighter systems and a consequently smaller logistical footprint, therefore, would translate to mobility and flexibility at nearly every level of war.[4]

The capability to see, understand, act, and kill faster than your enemy is a goal professional armies have pursued for hundreds of years, and it is this central motivation that drives our current efforts to rapidly transform our military. This concept certainly permeates the entire US Army's 2002 Objective Force concept. Many of the most recent theoretical discussions on this subject, particularly those arguments fostered by Colonel (retired) Douglas Macgregor, revolve around the fact that this dynamic has only increased in its relevance over the last fifty to sixty years. If the assumption holds that some future near-peer competitor will still be willing to face the US conventionally, then the value of an FCS equipped and organized Army, that flawlessly executes all of the capabilities promised in accordance with its promotion videos, is self evident. A twenty-first century conventional battlefield demands a high tech military.

Unfortunately, the major weakness of any future combat system concept today, in 2006, lies in its lack of immediacy in the near term. The US Army just does not have the technology in place yet, in the numbers of systems needed or the maturity required, to deliver on all of these extraordinary promises. With the majority of the FCS concept still on the drawing board, it begs the question: Does it make sense to begin radical transformation based on these concepts alone, when the capabilities of the interim

organizations appear to be much less than either the future force or the legacy force the US Army is supplanting? This study attempts to answer this central question.

To begin to honestly examine the roots of logic behind this evolution, this study must first begin by establishing some clear doctrinal definitions and perspectives. Until very recently, cavalry was understood as a type of maneuver organization, and reconnaissance was merely a mission set commonly executed by cavalry organizations as a natural extension of its other robust mission requirements. Now cavalry has been removed from the official US Army doctrinal lexicon in favor of a new organization, named after the core mission it is assigned to accomplish--that of reconnaissance. It is therefore critical that this study clearly define the differences between cavalry squadrons and reconnaissance squadrons to ensure clarity in the central issues at the core of this argument.

Cavalry is best defined by the 1996 version of FM 17-95, Cavalry *Operations*. This manual explains cavalry, at the height of its twentieth century organizational definition, as capable of accomplishing three core functions. First, cavalry units perform reconnaissance in accordance with current US Army doctrinal ISR practices, but can also conduct reconnaissance-in-force missions. Second cavalry units can perform security missions beyond the scope of just simple area security and counterreconnaissance screening. Cavalry units retain the ability to conduct guard missions, and in the case of regiments or brigades, can conduct covering missions for larger division or corps size organizations. Finally, cavalry organizations possess the robust firepower and protection required to conduct offensive and defensive economy of force missions (see table 1).

Table 1. Cavalry Missions and Capabilities- Circa 1996

Cavalry Missions and Capabilities Prior to Transformation

Roles	Reconnaissance	Security	Economy-of-Force
Mission Sets	Route Recon	Area Security	Offensive (Movement to Contact, Hasty Attack, Deliberate Attack)
	Zone Recon	Convoy Security	
	Area Recon	Screen	Defensive (Defend in Sector, Defend a Battle Position)
	Reconnaissance-in-Force	Guard	
		Cover	Retrograde (Delay)

Note: Cover mission capability is normally associated with regiment or brigade sized units or larger

The reconnaissance organizations currently forming inside the Army's modular brigades are defined much more narrowly in their scope of mission requirements. Like cavalry units, reconnaissance squadrons can still perform zone reconnaissance, area reconnaissance, and route reconnaissance; however, their biggest differences become apparent in the realm of security. In what the 2005 version of FM 3-20.96, *Reconnaissance Squadron*, calls "stretching the contact paradigm," the Army's new reconnaissance squadrons rely on the ability to conduct something called "reconnaissance pull" to guide combat power, placed elsewhere within the brigades, to handle the majority of their shooting requirements.[5] This leaves only screen and area security for the reconnaissance squadrons to perform. Any other security mission beyond that scope requires additional augmentation. It is this fundamental shift toward exclusive reconnaissance that marks the biggest difference between the old cavalry and the new modular reconnaissance concepts, and it is ultimately this difference that seems to be the main point of contention with the new concepts' sharpest critics.

A comparison of pretransformation doctrine and recently fielded reconnaissance squadron manuals is particularly illuminating regarding the dismissive logic behind these decisions. The primary schism seems to revolve around the concept of reconnaissance. The old cavalry line of thinking outlines a clear linkage between reconnaissance and security missions, while the new reconnaissance only doctrinal concept seems to assume a primacy of reconnaissance over security. Written into the text of the new reconnaissance field manuals is also the assumption that these new units will always have the ability to completely separate reconnaissance missions from security missions and requirements. It is interesting to note that, despite sixty-five years of evolutionary changes in cavalry doctrine and organizations supported by historical experiences in actual combat conditions, the US Army would so readily choose to completely dismiss heavy cavalry in favor of unproven and vulnerable reconnaissance squadrons. Much of the weight of the current transformation logic seems to rely heavily on a presumption of perfect situational awareness, driven by a complex system of sensors. These systems promise a consistent standoff capability that seems intuitively unlikely, given the routinely unpredictable nature of combat conditions. To make matters even more perplexing, the transformation to modularity has reduced the available combat power at the brigade level by one-third. Assuming that a reconnaissance squadron can even succeed in making contact on its own terms every time, in every situation, the average brigade combat team (BCT) commander must now commit at least half of his combat power to finishing decisively every time.

To establish a basis of comparison on the missions and roles of cavalry, one should first consider the US Army's twentieth century perspective. This study offers the

October 1995 version of US Army's cavalry troop manual, FM 17-97, *Cavalry Troop*. In this manual, reconnaissance is defined as "those operations undertaken to obtain information about the activities and resources of an enemy or about the meteorological, hydrographical, or geographical characteristic of a particular area."[6] The 2001 version of FM 3-90, *Tactics*, differs very little in its definition of the same mission, despite the emerging transformation efforts prevalent at the time of its publication. Ultimately, the basic understanding of reconnaissance then seems not to have changed, which would seem to indicate something else is driving the shift in doctrinal focus.

Reconnaissance is further explained in both FM 17-97 and FM 3-90 as having six fundamental aspects. Among the specific requirements are to maximize use of all reconnaissance assets; sustain orientation on the reconnaissance objective(s); and report information rapidly and accurately. There are also distinct aspects of the remaining three reconnaissance fundamentals that are more oriented toward security than on just gathering intelligence. The specific requirements are to retain freedom of maneuver, gain and maintain contact with the enemy; and develop the situation rapidly. These all imply a certain degree of aggressive maneuver and offensive action against an enemy. This would seem to preclude an exclusive focus on purely stealthy infiltration and quiet observation. FM 17-97 goes further in spelling out the requirement for reconnaissance elements to survive first contact, maneuver to maintain contact, and fight for information as necessary.[7] Prior to the transformation efforts that began in 1998, US Army doctrine seems to reflect the wisdom that, without adequate protection and firepower of reconnaissance assets, half of the fundamentals of reconnaissance specified in our doctrine were difficult if not impossible to accomplish.

For the twenty-first century view of reconnaissance, the new 2005 version of FM 3-20.96, *The Reconnaissance Squadron,* posits a series of doctrinal concepts that seem to be based more on assumptions than on facts. The new FM 3-20.96 dismisses the old line of cavalry thinking by shifting the responsibility for fighting in direct contact to battlefield operating systems that exist outside of the reconnaissance units themselves. Chapter 3 of FM 3-20.96 states these concepts as follows:

> UAVs and ground sensors provide the squadron with early warning and help limit exposure to enemy reconnaissance and acquisition systems. They may also provide the squadron with maximum standoff range should the BCT commander decide to engage the enemy force with lethal fires. Once contact occurs, the squadron must maximize the use of its organic mortars and leverage Army and joint precision fires and effects as necessary to maintain freedom to maneuver. The squadron must also be prepared to conduct effective handover of threat elements to supporting friendly maneuver forces.[8]

In five lines of text, the latest US Army reconnaissance doctrine assumes away decades of lessons learned in combat, in favor of a new method of maneuver warfare that hinges its success on the consistent ability to begin every engagement on its own terms, and hand the fight off to someone else. Two critical and highly questionable assumptions are apparent in the above doctrinal concept. First, Unmanned Aerial Vehicles (UAVs) and electronic sensors will always work in locating the enemy first. If this presumption were not the case, then the predication on early warning to provide standoff and maneuver options would not be valid. Second, once contact occurs, mortars and precision fires will always be available and effective. Were this not the case, then the presumption against unnecessary organic direct fire action would not be valid.

Ultimately, the entire set of new reconnaissance techniques and methods spelled out in the 2005 version of FM 3-20.96 rests on the notion that reconnaissance missions can be measurably and distinctly separated from security missions and their traditional

demands for organic firepower and survivability. Furthermore, with security missions and their requirements now torn away from reconnaissance missions, those units operating out in front are now free to focus exclusively on ISR, and someone else with the security mission will always be there to assist, should the reconnaissance unit run into trouble. These assumptions are woven throughout the manual, and without them, few of the methods of reconnaissance, surveillance and target acquisition outlined within its chapters will stand up to close scrutiny.

In addition to the doctrinal presumptions outlined in the logic study above, there are other assertions outlined in the new FM 3-20.96 that are illustrative of some of the possible motivations of transformation thinkers.

> Unlike Cavalry Regiments and Squadrons of the past that had organic armor, aviation, and artillery, the BCT Reconnaissance Squadrons are not designed, equipped, nor intended to be employed as a robust direct combat force. Although they possess sufficient armament and firepower for self defense, they were not over-endowed with weapons systems and armor protection for a distinct reason. The historical principle is that reconnaissance units that are sufficiently equipped to fight ***are*** routinely used for fighting instead of performing reconnaissance. In our Nation's history (which in this specific case mirrors the martial reconnaissance history of most other modern armies), reconnaissance and cavalry units that were impressively armed (possessed of organic armor, aviation and artillery, for example,) routinely proved too much of a temptation for commanders to employ in direct combat modalities. Whenever this occurs—when reconnaissance units engage in direct combat missions, one thing has been proved certain—*reconnaissance ceases*. When reconnaissance ceases, the potential for achieving and capitalizing upon information dominance is lost.[9]

There are two critical presumptions in the paragraph above that this study closely examines. The first questionable strand of logic seems to be that modern history somehow proves a case that heavily armed reconnaissance and cavalry organizations do not perform reconnaissance once engaged in direct combat. The fallacy of this assertion lies in the apparent failure of the doctrine writers to recall the security oriented aspects of

reconnaissance missions. The second questionable element in this extract seems to be that, by removing certain “impressive armaments” from reconnaissance units, the US Army can somehow preclude their involvement in direct combat, as if operational requirements, terrain, weather, and the enemy never have a contributing factor on the bearings of what missions reconnaissance units might get asked to perform. It would seem, from the logic cited above, that FM 3-20.96 is making an institutional effort to protect brigade commanders from themselves by taking away combat power, much in the same way a mother avoids giving an irresponsible small child a pair of pointed scissors. The fallacy of this argument is that it seems to presume brigade commanders have historically been the root of the problem, not the desperateness of battlefield circumstances. It is the intent of this study to avoid such specious logic and rhetoric and place a more skeptical eye toward what historical evidence actually demonstrates.

The organization and methodology of this study attempts to brush away the presumptions and questionable rhetoric to get at the root of what the US Army needs to accomplish to ensure its reconnaissance and security requirements are met. To that end this study will first explore three historical case studies of reconnaissance and security operations; a comparison and contrast of German and American reconnaissance experiences in World War II, an examination of American armored cavalry in Vietnam, and finally an exposure to recent reconnaissance and security experiences in Iraq. This study then examines the latest reconnaissance, surveillance, and target acquisition concepts and doctrine along with a discussion of recent performances by transformed modular reconnaissance squadrons in simulations and at the combat training centers. If the revised concepts outlined in the new FM 3-20.96 are valid, then they should first

demonstrate their effectiveness in training and simulation, before we commit these new organizations in actual combat.

After examining historical examples and recent cavalry and reconnaissance experiences, this study will offer analysis and a discussion of implications for current and future US Army reconnaissance organizations. Finally, this study will discuss overall conclusions and recommendations for improvement of both doctrine and the new reconnaissance squadrons. As healthy as the questioning of old methods and organizations is, so must the US Army be equally willing to question any recommended changes that seem to diminish established capabilities without a clear demonstration of what it stands to gain by changing.

To maximize the relevance of this study, the scope of this discussion will be limited to a focus on historical examples in the middle to later half of the twentieth century and on recent examples in the twenty-first century through 2005. Additionally, examination of reconnaissance and security concepts, operations and organizations in the twenty-first century will only focus on those systems and units that actually currently exist. This study will not attempt to conclusively prove, through either statistical metrics or anecdotal evidence that the projected Future Combat System (FCS) concepts themselves will or will not work. Such a tasking is not possible without major institutional support and the physical presence of enough of these systems to actually conduct a series of exercises. At any rate, Major Thomas Cippolla seems to have already adequately addressed the FCS in his recent monograph, “Cavalry in the Future Force: Is There Enough?” Major Cipolla’s research offers clear conclusions and recommendations for the Future Force, thus eliminating the need to reexamine it in this study.

The focus of this study is on recently transformed cavalry organizations and on their abilities to meet doctrinal reconnaissance and security requirements as they exist today. This study will not attempt to describe or extend analysis of the relationship between cavalry reconnaissance and security back to the nineteenth century. A revisit of the old horse cavalry debate, though often cited by some transformation proponents seeking to diminish the arguments of mechanized cavalry traditionalists, is not relevant to this discussion and offers nothing to illuminate the wisdom of any of the decisions relating to transformation policies. Furthermore, the gradual demise of most horse-mounted units in the period from 1919 to 1942 seems to have answered that debate long ago. What this study will focus on are relevant examples of modern armored reconnaissance units, over the last sixty-five years, and their organizational, operational and tactical answers to the challenges they faced in conducting both reconnaissance and security missions.

This particular study is significant to the current cavalry transformation debate for several reasons. First, this study offers a careful examination of the logic supporting the need to transform and offers honest debate on this subject that is broad in its scope and critical in its analysis. Given the current fluid nature of changes in the maneuver community, a certain anxiety persists over exactly how these decisions to transform were made. This study hopes to clarify the ongoing debate by examining, from a historical perspective, the following primary question: are the current reconnaissance squadrons adequately equipped or organized to answer the needs of the new modular brigade combat teams? Secondary to answering that question is discerning what some of the most significant examples of mechanized cavalry operations over the last sixty-five years show

us about the fundamental linkages between reconnaissance and security in modern maneuver warfare. The purpose of this study, once the historical analysis is completed, will then be to address the implications of this relationship on the continued development of the new modular reconnaissance organizations.

In addition to this primary question, there are also some more specific issues that warrant additional inquiry. Many concerns voiced across the armor and cavalry community over the last four years have echoed at least two other consistent questions. First, what, if anything, has changed so fundamentally about the traditional nature of modern cavalry operations that the Army should now allow dramatic reductions in security capabilities among cavalry organizations? Second, if recent technological advancements are alleged to have changed historical cavalry paradigms so fundamentally as to warrant these radical changes, where is the observable proof?

There are also several subquestions relating to the primary question that are essential to thorough analysis. Among these questions are: What are the most significant examples of cavalry operations over the last sixty-five years? What do these examples demonstrate regarding the linkages between reconnaissance and security? What does current doctrine say and how does it contrast with the linkages described above?

To answer the questions above, this study begins in Chapter 2 with an examination of the experiences of two transformational armies in World War II. Both the American and German armies of the 1930s and ‘40s faced similar problems in evolving their armies toward mechanized maneuver warfare, and their experiences, frustrations, and solutions are supremely relevant in establishing a historical baseline for this study.

In Chapter 3, this study explores cavalry operations in asymmetrical conflicts. Starting

with Vietnam, Chapter 3 offers examples of mounted operations in an unconventional threat environment. Chapter Three also considers if uniquely specialized reconnaissance and security organizations are even necessary, given some of the more recent operational demands on armored and mechanized organizations in Vietnam and Operation Iraqi Freedom. There are some who have suggested the possibility that these recent experiences demonstrate the capacity of other non-specialized armored forces to perform reconnaissance and security just as well as cavalry units.

Chapter 4 offers analysis of what history demonstrates regarding the evolution of reconnaissance and security over the past sixty-five years and what this means to US Army transformation efforts today. Integral to this portion of the study is the discussion of recent examples of tactical simulations conducted as a part of the Cavalry Leaders Course from January through August of 2005 that tested these new reconnaissance squadrons and the doctrinal concepts behind them. Chapter 4 also discusses some of the capabilities and limitations of the new modular reconnaissance squadrons.

This study also ties its conclusions to what the latest revised doctrinal manuals have to say about reconnaissance and security operations. The historical relationships in this study are used to support or dismiss current transformation decisions and doctrinal concepts. Chapter 5 concludes this study with a discussion of the implications of these results, an examination of some of the logic behind current transformation efforts, and also offers some suggestions on how to augment or adjust these new reconnaissance squadrons to make them more capable.

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[1] Gregory Fontenot, et al., *On Point: The United States Army in Operation Iraqi Freedom* (Washington, DC: Combat Studies Institute Press, 2004), 415.

[2] United States Army, FM 3-20.96, Final Draft, *The Reconnaissance Squadron* (Washington, DC: Department of the Army, November 2005), 1-16 to 1-20 (hereafter cited as FM 3-20.96).

[3] Eric K. Shinseki, General. *United States Army White Paper: Concepts for the Objective Force* (Washington, DC: Department of the Army, November 2001), iv.

[4] Ibid., 6-11.

[5] FM 3-20.96, 1-3 to 1-10.

[6] United States Army, FM 17-97, *Cavalry Troop* (Washington, DC: Department of the Army, 1995), 3-1.

[7] Ibid., 3-1, 3-2, 3-3.

[8] FM 3-20.96, 3-37.

[9] Ibid., 1-2, 1-3.

CHAPTER 2

CAVALRY OPERATIONS IN WORLD WAR TWO

As the US Army attempts to transform cavalry organizations into new reconnaissance squadrons, it is also attempting to redefine cavalry operations to exclude nearly every one of the security missions, traditionally executed by cavalry, in favor of an exclusive focus on reconnaissance. It is therefore critically important to this study to examine some of the more significant experiences with this concept. There are several relevant examples of these demands in the twentieth century. This study focuses on the German and American experiences with equipping, experimenting, testing, and modifying reconnaissance organizations in World War II. These experiences are important because many of the assumptions made by both armies just prior to the war bear an eerie similarity to many of the fundamental assumptions the United States is currently making with its new modular reconnaissance squadrons. If there are historical counterpoints to the US Army's effort to recalibrating itself to do more with less against large maneuver forces, they may appear in World War II examples. During World War II, two innovative and industrialized armies, the United States and Germany, made similar aggressive, experimental attempts to go light and fast against well armed, massed maneuver formations. The results are informative.

Before accepting any logical premises on the transformation of cavalry, the US Army must determine the actual patterns of demands, under combat conditions, placed on cavalry organizations. The one consistent thread observable in the German and American experiences in World War II seems to be that cavalry units routinely demonstrated better

mobility than most of the larger, heavier main forces they were tasked to serve and were likewise able to execute a higher level of maneuver and operational tempo. This led commanders to employ their cavalry organizations and reconnaissance pure units in roles for which they were never originally designed. The early war experiences of both the Germans and Americans reflect these realities. Whether they were too light to survive or too costly to replace when attritted, these cavalry forces were, never-the-less, often thrown into combat when there were no other units available. The analysis of reconnaissance and security operations in World War II shows that, when employed properly in battle, cavalry forces could do their job, but when under-equipped or misused, they were foolishly sacrificed and costly to replace.[1]

Most recent twentieth century examples seem to give credit to the necessity of having cavalry organizations that are both robust and capable of performing many missions other than simply reconnaissance. On the modern battlefield, reconnaissance missions often rapidly transition into security, defense, or attack missions the moment contact is made with the enemy. The American experience prior to World War II looks remarkably similar to the rapid developments ongoing in the US Army today. Enamored with the promise of mechanization and motorization in the 1930s, the US Army eliminated the horse cavalry by 1942 and replaced the old cavalry organizations with those dominated by light wheeled systems. The illustration in figure 1 depicts these concepts as they appeared before the outbreak of war.

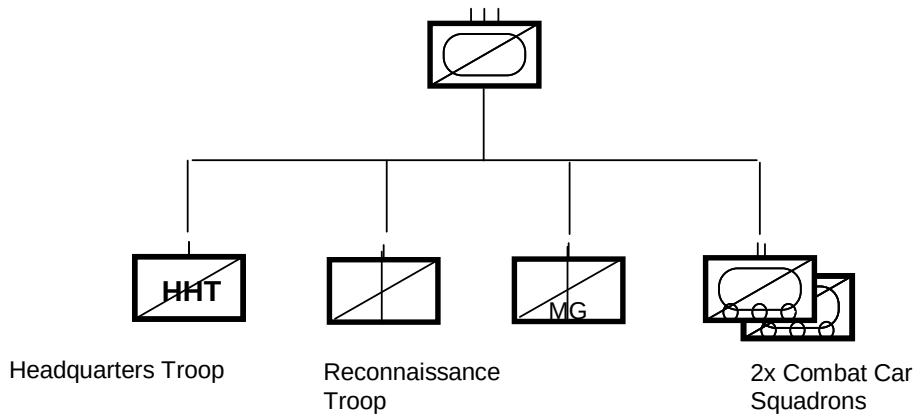


Figure 1. Prewar Configuration of US Army Motorized Cavalry in 1938

There were a number of invalid assumptions borne out of American interwar doctrine and the General Headquarters (GHQ) Maneuvers, from 1940 to 1941. First, there was an expectation that friendly airpower would consistently provide "an umbrella of visibility" where ground reconnaissance assets could maneuver freely in between opposing armies.[2] This would theoretically create a permissive environment where cavalry units would have early warning of any enemy presence. Given this perfect situational awareness, friendly reconnaissance units could operate out of direct fire contact with the enemy, thus negating the need for specialized units capable of sustained combat. Second, many leaders believed new cavalry units possessed an unstoppable maneuver capability. If contact ever was made with the enemy, these leaders presumed there would always be maneuver space to find a way around. Thus, this notion held that cavalry could always focus on reconnaissance only and consistently avoid direct combat.[3] Unfortunately, these presumptions contributed to an early war force that went

into combat with imperfect doctrine and organizations too light and weak to measure up in the heat of actual battle. Clinical observations in antiseptic exercises would prove invalid under the lethal guns of the experienced German Africa Corps.

The American World War II experience demonstrated, more often than not, that being fast and light is seldom enough to survive repeated hostile action. Furthermore, just because a cavalry organization was labeled a reconnaissance force did not mean it would not get ordered to stand and fight when alternative sources of manpower ran low. Reconnaissance organizations, from Kasserine Pass to the Battle of the Bulge, were often placed in combat situations when maneuver commanders ran into shortages through attrition or circumstance. By the end of the war, the United States Army had concluded that reconnaissance units must be balanced in firepower and agility, because reconnaissance conducted alone was a rare occurrence. A staggering 97% of the time, American cavalry groups in World War II executed other types of missions independent of their original role as an exclusive reconnaissance force.[4] Real battlefield circumstances demanded this, as a matter of efficiency for commanders in apportioning their limited resources.

The American experience of cavalry transformation began with an examination and often bitter debate in the interwar period over the necessity for horse mounted cavalry and the promises of motorized and mechanized reconnaissance. One typical example of the pre-war debate was Major James Curry's discussion on cavalry and reconnaissance transformation, done as a paper at the US Army Command and General Staff College in 1936.[5] Like many of the US Army's transformation advocates today, Curry criticized the contemporary understanding of the principles of mass as wasteful and

unwieldy. The application of mass in World War One was as a crushing mechanism incapable of winning clear victories. His vision of the future projected mobile forces maneuvering against enemy lines of communication and supply, flanks and rear areas. Curry quotes one of the most influential thinkers of the era, General Douglas MacArthur, to summarize the growing momentum toward maneuver warfare as "an inevitable trend…toward greater speed of strategic maneuver through maximum utilization of fast machines" and the integration of other battlefield operating systems.[6] For the majority of the transformation advocates of the interwar period, it was the obsession with mobility at the expense of all other considerations that seemed to drive their thinking.

As early as 1936, US Army leaders did acknowledge the need for reconnaissance organizations to conduct offensive operations to take prisoners, fight to penetrate enemy screening forces, or to conduct reconnaissance in force as a means to test the strength of enemy resistance.[7] It is interesting to note, however, that this recognition of the likely need to fight for information and penetrate enemy defenses did not immediately influence US reconnaissance organizations, which remained deficient in protection and firepower. Vulnerable motorcyclists, truck-drawn light artillery, motorized engineers, and squadrons of light armored cars all were still seen as acceptable platforms for inclusion in reconnaissance detachments. This emphasis on speed and stealth over survivability and firepower persisted through the Louisiana Maneuvers and on through late 1941 (see figure 2).[8]

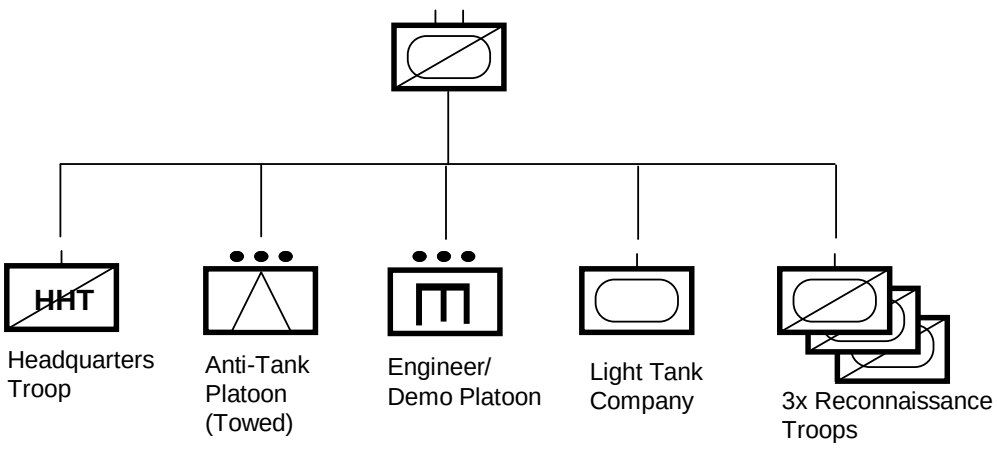


Figure 2. Early War US Cavalry Reconnaissance Squadrons in 1942

The US Army did eventually recognize the vulnerabilities of armored car units to infantry, antitank fire, and artillery in the prewar exercises.[9] Additionally, the final conclusions of observers at all levels during the 1941 GHQ maneuvers was that reconnaissance had been generally poor and that commanders had committed reconnaissance troops without adequate information and often without proper security.[10] Colonel John A. Considine summed up the observations of many cavalry leaders present for these maneuvers. He declared that stealth alone was not "worth its salt" for both distant and close reconnaissance requirements.[11] In Considine's opinion, the need for firepower and protection were both real and constant for the new mechanized cavalry, if they were going to survive and report on the real battlefield. Considine saw right through the "reconnaissance only" dogma, declaring that cavalry had been emasculated by taking away combat missions and giving them to the armor branch.[12] It appears that, even

during the prewar exercises, cracks in the façade of combat avoidance were beginning to appear.

In spite of all these issues, there seems to be little evidence of any immediate effort to adjust emerging reconnaissance doctrine or organizations. In fact the solution to these observations, as advocated by *Training Circular, No 18*, was to simply continue to re-emphasize stealth as the primary means of survival for all new cavalry organizations.[13] Cavalry doctrine for both battalions and regiments had evolved to one simple mantra by 1941: "conduct reconnaissance and avoid fighting."[14] This ultimately gave rise to the final version of prewar mechanized cavalry doctrine, FM 2-15, *Employment of Cavalry*. By April 1941, the traditional cavalry missions of exploitation, pursuit, and direct combat, which required more significant firepower and protection, were given to the new armor branch. The remaining mission of reconnaissance, assumed now to preclude the requirements to fight and survive in direct combat, became the sole role of mechanized cavalry.[15]

Prior to the US Army's first experiences in North Africa, the overarching theme of cavalry transformation seemed to be one of experimentation and an exclusive focus on reconnaissance missions at the expense of training and equipping for anything else. The American experiences in 1942-43 in North Africa, however, brutally put to rest any notion that reconnaissance forces could achieve their missions through stealth, speed and audacity alone. By placing an exclusive focus on reconnaissance, both in terms of training and organizing its cavalry units, the US Army set the conditions for failure should those organizations be asked to do anything else, beyond simply surveying the enemy.

The experience of the 81st Armored Reconnaissance Battalion (ARB) in January and February of 1943 was representative of the problems encountered by mechanized US cavalry units early in the war. The 81st ARB lacked the most basic mobility and survivability needed to infiltrate or bypass prepared enemy positions, thus it could not complete deep reconnaissance objectives. It also lacked the firepower and protection needed to resist direct and indirect fire, either on the attack or in the defense. The battalion could not hold terrain once it was occupied, nor could it repel or delay an attacking enemy as an integrated part of a deliberate defense. Though most of these missions were non-doctrinal, this still did not prevent them from occurring. Terrain, the enemy, the shortage of combat troops, and the decisions made by division leadership to engage its cavalry in economy-of-force missions all conspired to push the 81st ARB into forms of combat for which it was not designed.[16]

The results of this battalion's initial engagements and the similar failures of other reconnaissance units in theater pointed to two critical flaws in the initial configuration and doctrine of mechanized cavalry forces. First, the US Army's 1941 mechanized cavalry doctrine focused on reconnaissance but failed to address any of the other security and economy of force missions so often common to traditional cavalry units. It was a mistake to assume that reconnaissance forces would never conduct security, attack, defend, or delay, and by omission of discussion on those subjects, that is exactly what the 1941 version of FM 2-15 did.[17] Second, the lack of firepower and adequate armor protection provided to early war reconnaissance units subjected them to frequent failure, as they had virtually no capability to adapt and overcome when more dangerous, non-doctrinal missions appeared.

Major General Charles Scott, liaison to the British 8th Army and an authority on armor tactics in the North African desert, observed in 1942 that weak reconnaissance units could get nowhere on the battlefield. The requirements inherent in the need to survive and fight for information ensured that the ability to conduct observation alone afforded no protection to cavalry assets. Only through producing units with "punch" and the ability to kill, while conducting reconnaissance missions, could the US hope to be successful.[18] In Scott's eyes, the relationship between reconnaissance and security was immutable. Long distance reconnaissance forces had to be organized robustly enough to avoid being overrun and destroyed prior to obtaining and sending information of value. Reconnaissance units had to be able to fight for information, buy time to send that information, and delay long enough for the friendly main body to act on that information properly.[19]

By mid 1943, US doctrinal concepts and organizational changes began to reflect some of the lessons learned in North Africa. Despite the US Army's original exclusive focus on reconnaissance, many cavalry leaders began to openly acknowledge a different set of battlefield realities and made efforts to change what they could. Many now openly recognized the aggressive nature of combat reconnaissance.[20] The missions of screen, guard, and cover, movement-to-contact, attack, pursue, and delay frequently occurred more often than just reconnaissance alone. Some observers still cautioned against the continued abuse of even well-augmented cavalry organizations, as repeated engagement in aggressive missions outside of reconnaissance rapidly reduced cavalry unit effectiveness.[21] However, by late 1943 most reconnaissance leaders now came to regard themselves as combat forces.[22] The ultimate result of the lessons learned in North Africa

was to force the US Army to admit reconnaissance was but a small part of the myriad missions required of cavalry forces.

This recognition of a shift in the realities of the battlefield created subsequent changes in doctrine, organization, and equipment that would later make a difference on the European continent. [23] Not withstanding changes to the cavalry field manuals, FMs 2-15, 2-20, and 2-30, the June 1944 addition of FM 100-5, *Operations*, is also fairly indicative of the eventual cultural shift that was occurring army wide toward accepting combat as a part of cavalry operations. In accepting the realities of battlefield reconnaissance, the US Army now admitted that "frequently essential information [could] only be obtained through attack. Reconnaissance units [must] attack when their mission requires it."[24] This reflected a far departure from the days of stealth and observation alone, where combat was to be avoided at all hazards. Changes to tables of organization and equipment prior to June 1944 also made a significant difference (see figure 3). Though still light by armored unit standards, cavalry equipment was improved and upgraded incrementally in all areas of firepower, mobility and protection. M8 armored cars with 37mm guns replaced M3 scout cars. M8 full tracked howitzers replaced half-tracked assault guns, and M5 light tanks replaced the more thinly armored and less mobile M3 light tanks.[25] By June of 1944, the US Army went into Normandy better prepared to deal with the full spectrum of missions beyond just simple reconnaissance.

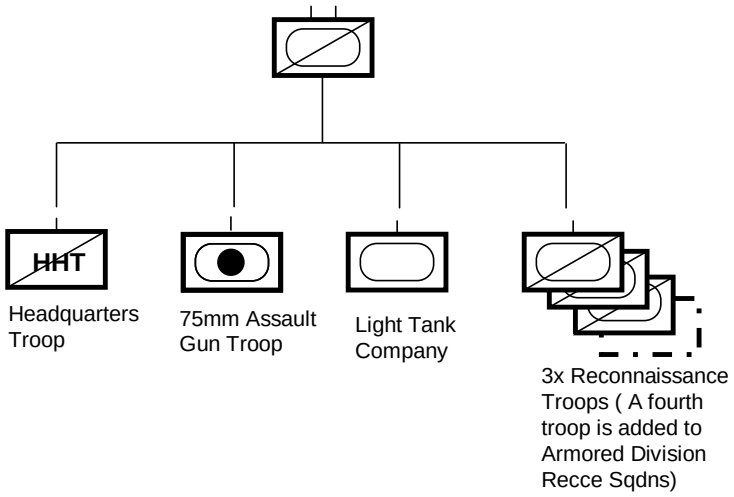


Figure 3. Midwar Improvements to US Cavalry Formations, September 1943

The American experiences in the Normandy and Ardennes campaigns reemphasized many of the lessons learned in North African and had an important and lasting affect on the US Army's vision for cavalry operations after the war. In Normandy, the compartmentalization of maneuver corridors often forced aggressive reconnaissance efforts into deliberate attacks. The old doctrinal presumptions that cavalry units could bypass strong points proved impracticable, when faced with the reality of restricted terrain and a well prepared enemy.[26] Within the first month of operations in Normandy, cavalry units found themselves executing offensive missions to seize terrain and then hold it against repeated German counterattacks.[27] Normandy taught the US Army both the value of defensible terrain against massed mechanized formations and the cost of sending troops into battle inadequately armed. This lesson was clear to both the armor and cavalry communities by the end of the summer of 1944.

The German counter-offensive in December of 1944 in the Ardennes, however, best illustrates the tragic results of when cavalry was asked to do too much. The 14th Cavalry Group's overstretched effort to defend the Losheim Gap against two German infantry divisions is a case study in just how far desperate commanders will go in finding assets to fill in gaps. The 14th Cavalry Group was tasked to secure a front too broad in width for its meager allotment of combat power. With little time to coordinate a coherent defense and inadequate firepower present in its light tanks, the 14th Cavalry collapsed rapidly under pressure and failed completely in its counter-attack efforts. [28] It is examples like the Losheim Gap debacle that demonstrated the results of the consistent extension of cavalry missions into deliberate defense, security, attack, and economy-of-force roles. By the end of the war, these experiences had removed all lines of distinction between reconnaissance and security. These lessons in combat forced an acknowledgment by the US Army of a need for substantial improvements to survivability and firepower in its cavalry organizations.

By early 1945, one answer to the need for improved firepower and protection came in the form of the M24 Chaffee. The Stuart series of light tanks had remained one of weakest links in the design of the cavalry organizations. Its 37-millimeter gun provided no greater firepower than the M8 armored car, and by 1944 it was obsolete against nearly all German armor.[29] With its 75-millimeter gun, the M24 provided a much sought-after tank killing capability. Many squadron commanders finally considered their tank troops as a legitimate maneuver asset with this new platform.[30] The ultimate solution for what cavalry units needed seemed to be reached just in time for war's end. The US Army's cavalry and reconnaissance organizations, having suffered through four

years of trial and error, doctrinal mismatch, and inadequacies in equipment walked away from World War II with some important lessons. First, the doctrinal and tactical assumptions gleaned from the Louisiana Maneuvers were entirely wrong. With 97% of all combat missions assigned to a cavalry groups consisting of mission sets that resided outside of its prescribed reconnaissance role, the initial doctrinal concepts were flawed. For the US cavalry community, World War II became all about identifying and correcting these flaws. Ultimately, a doctrinal concept emerged incorporating a balance of reconnaissance and security requirements. Second, fast and lightly armored might have worked if observation was all cavalry would ever do, but this was seldom the case. When commanders desperately needed combat power they inevitably turned to the cavalry as their gap filler. The real challenge for equipping and organizing cavalry forces had become how best to balance firepower and survivability without compromising agility. By the end of the war, the US Army ultimately concluded that reconnaissance units must be balanced in firepower and agility, because they had eventually assumed all of the old traditional reconnaissance and security missions of the horse cavalry.[31]

The German experience in World War II illustrated similar conclusions regarding the realities of light reconnaissance organizations in combat. German prewar reconnaissance doctrine looked remarkably similar to early US Army concepts: a lightly armed, lightly protected force relying for success on speed, mobility, and early detection. Its survival depended on the timely arrival of heavier units equipped to actually dispatch the enemy. German Army doctrine from the era did assert the critical necessity of the reconnaissance arm. Reconnaissance was considered “the essential prerequisite” to the larger successes of the heavier panzer forces.[32] Despite this recognition the German

Army created a significantly vulnerable reconnaissance force at the beginning of the war. Contrary to the popular image of the German Army, they made many mistakes at the organizational, operational, and tactical levels, especially in matters of reconnaissance.[33] The German Army actually began World War II with imperfectly constructed reconnaissance forces and inadequate reconnaissance doctrine. The realities of protracted conflict eventually forced significant changes to both throughout the course of the war.

The *Wehrmacht* expected a short war; this optimistic expectation ultimately met with significant change by 1943, based on negative experiences in the opening campaigns in Poland, France, Russia, and North Africa. The reality of actual combat forced the gradual evolution of German mechanized reconnaissance and security forces. Changes made during the mid-war period reflected additional adjustments to tactics and reallocation of firepower in light of mounting casualties and the realities of sustained combat. The German Army ultimately learned that there was no distinct separation between reconnaissance and security in an environment of near continuous combat, and this was true for both offense and defense. Eventually, by the end of the war, reconnaissance and security units and their practices reflected a near total abandonment of the original light and fast capabilities of the early war in favor of a pragmatic acceptance of the need for both the survivability and firepower of heavier organizations.

At the beginning of World War II, the doctrinal and organizational outlook of the *Wehrmacht* toward reconnaissance and security reflected a clear focus toward lighter, highly mobile reconnaissance units. Dedicated armored reconnaissance organizations were to maneuver themselves to enable operations well forward of the panzer forces and deep in enemy territory. This led the German doctrine developers and the operational and

tactical planners toward an initial emphasis on speed and stealth above firepower or protection for their reconnaissance assets.[34] The German army used light wheeled organizations consisting of motorcycles and thinly armored reconnaissance vehicles to meet *Wehrmacht* reconnaissance requirements. These units relied almost exclusively on speed and stealth, two qualities often mutually exclusive and at odds with the realities of the real battlefield. These light reconnaissance organizations were also expected to conduct rapid battle handover of whatever targets they encountered to the heavier panzer units traveling behind them. This often proved to be difficult to accomplish.

To complicate matters of coordination and integration, very few reconnaissance assets were assigned directly to panzer units. From 1939 until early 1943, German tables of organization and equipment assigned tank regiments and battalions only one light reconnaissance platoon specifically designated for reconnaissance. Most standard tank battalion reconnaissance platoons were equipped only with light wheeled vehicles at the beginning of the war, receiving armored half tracks eventually as the war progressed. This limited their tactical utility to terrain reconnaissance only.[35] Only at the division level did reconnaissance organizations operate at above company strength. In heavy tank companies and battalions, their organic reconnaissance unit was often no more than a platoon of five light tanks that pulled double duty as a local security force for the heavier main body (see figure 4).[36]

From 1939-1940, even the dedicated armored reconnaissance regiments and specialized reconnaissance battalions were equipped primarily with weak and vulnerable motorcycle units. Each division possessed one motorcycle pure reconnaissance battalion and one armored car equipped reconnaissance battalion at the outset of the war (see

figure 5). Of particular note, the initial *Wehrmacht* doctrine concerning reconnaissance operations had a gap that became apparent when exposed to the realities of combat. At the tank company level or higher, there was no special discussion of tanks conducting their own reconnaissance operations when necessary. The primary reason for this stemmed from the perception that reconnaissance was not an appropriate task for a tank.[37] Thus, at the beginning of the war, the motorized organizations assigned the role of reconnaissance were not adequately armed or equipped to perform the task, and those armored organizations who were adequately armed and equipped were not doctrinally trained for the mission.

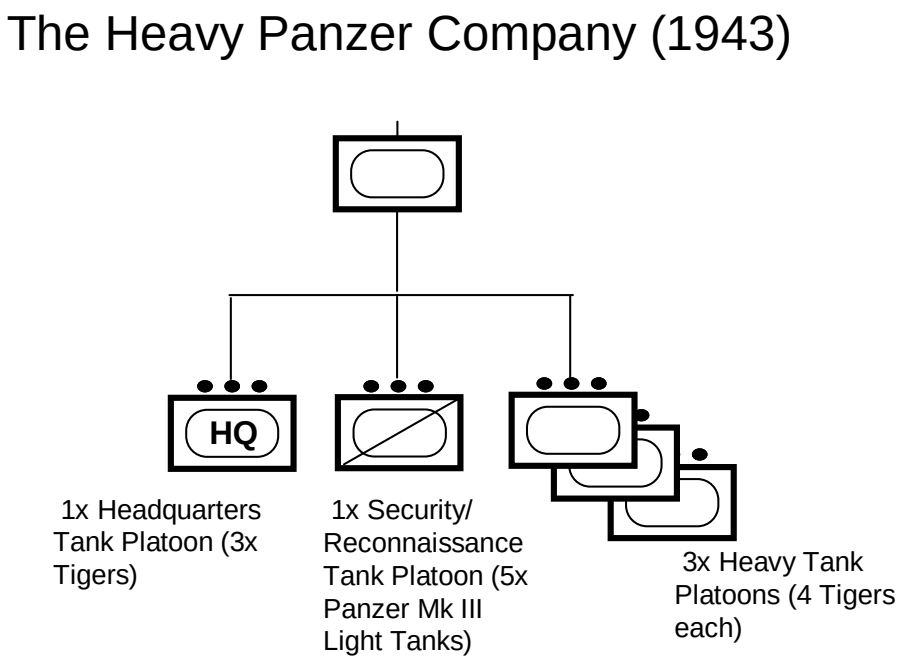
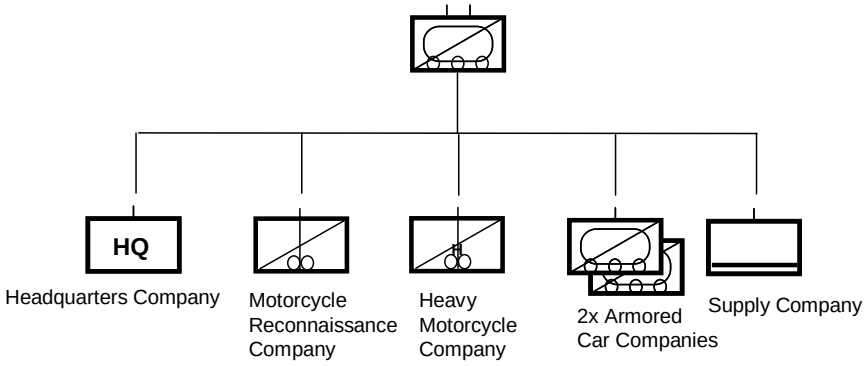
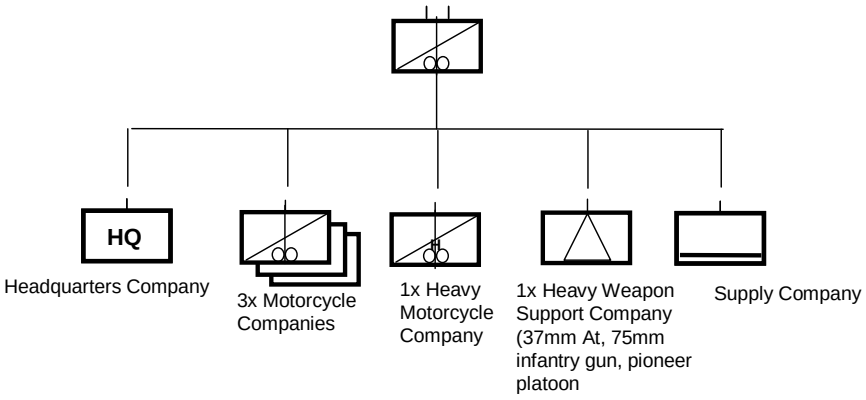


Figure 4. The German Heavy Tank Company in 1943

German Armored Reconnaissance Battalion
(September 1939-February 1941)



German Motorcycle Reconnaissance/Infantry Battalion
(September 1939-May 1941)



German Armored Reconnaissance Battalion
(February-May 1941)

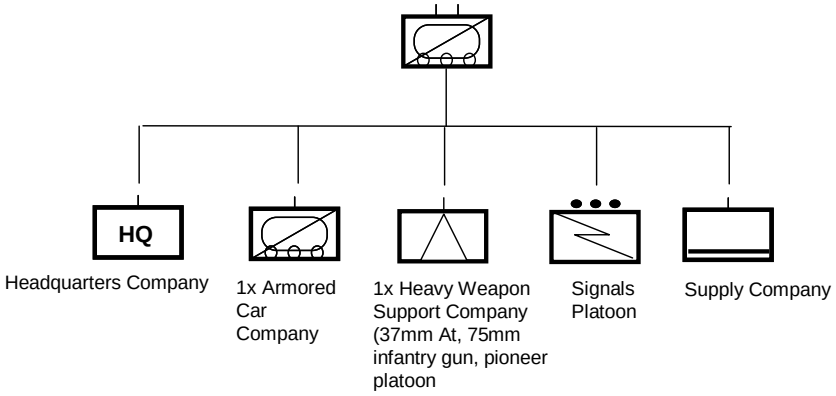


Figure 5. Early War German Armored and Motorcycle Reconnaissance Battalions

Most of the initial German operational concepts and assumptions regarding the employment of reconnaissance assets ultimately met with mixed success during the opening stages of World War II. It is true that the successful German campaigns of 1939-41 were dramatic enough to shock the world and coin buzzwords like “blitzkrieg,” but this all came at a price to most of the reconnaissance units that helped make them possible. The weak and vulnerable motorcycle reconnaissance troops were not as mobile as hoped, took heavy casualties, and were scrapped by 1941. Losses among motorcycle battalions were so appalling during the “Barbarossa” campaign in Russia that the units involved were completely disbanded and the survivors sent to armored reconnaissance battalions (see figure 6).[38]

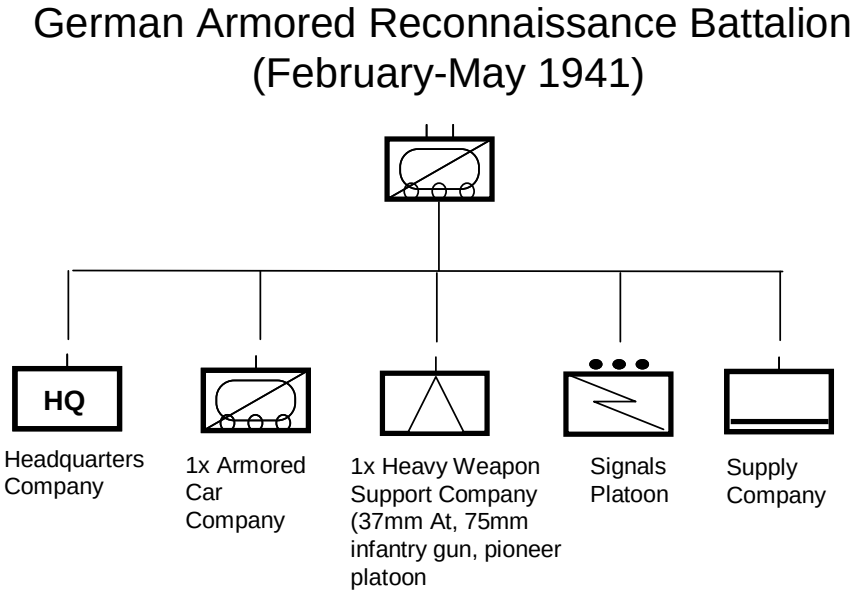


Figure 6. Adjustments to German Reconnaissance Battalions Following Losses in Poland, France, and Russia.

The early German Panzer Mark I and II tanks were also found wanting in protection and armament, especially on the Russian front. Beyond reconnaissance missions against the lightest of opposition, these light panzers were useless by late 1941. Production of both of these obsolete tanks ceased by 1942.[39] None of these reconnaissance units, across the scope of the entire *Wehrmacht*, were uniformly organized or equipped in the early war period. This situation reflected an unfortunate reality of material and personnel shortages present prior to the beginning of the war more than any deliberate operational or tactical planning deficiencies.[40]

Ultimately, the German Army began World War II with a mixed bag of unproven doctrinal concepts, untested combat platforms, and a whole host of other subordinate issues, ranging from the resource limitations and organizational flaws inherent to any military attempting to conduct a massive retooling effort. These problems were clearly apparent throughout Germany's reconnaissance forces. The early offensive campaigns from September 1939 to the summer of 1941 sorely tested most of the optimistic assumptions made in the construction of both the panzer corps and the supporting reconnaissance organizations, especially in terms of firepower and survivability. It was these hard lessons, paid for in blood and destroyed equipment, that led to the complete reorganization of most of the reconnaissance units in the German Army in the period between July 1940 and May 1941. [41] There were even more adjustments made, as the nature of operations changed on the Eastern Front in the period between 1942-43.

From December 1942 to the summer of 1943, things began to look significantly different for the German war effort as operational requirements began to change. By late 1942, German reconnaissance tactics became more aggressive. Reconnaissance units

where often reinforced with additional firepower from tank and infantry units and would attack as soon as contact with an enemy was made.[42] German tank battalion tactics in the conduct of the deliberate attack now insisted that forward and flank reconnaissance should be conducted by sections of Mark III tanks, rather than the wheeled or half-track reconnaissance assets common to so many units at the beginning of the war.[43]

Advances in Soviet armored firepower and protection also began to demand innovative responses in German arms and organizations (see figure 7). [44] By the summer of 1943, as Germany's new Tigers, Panthers, and up-gunned Mark IV tanks answered the Soviet T-34s and KV-1s, its reconnaissance forces also grew heavier to compensate for their own inadequacies in both firepower and survivability. In the new panzer regiments, light tank reconnaissance and security platoons were replaced with medium Mark IV or Panther tanks, displacing the lightly armored halftracks equipping the earlier reconnaissance platoons.[45] In the divisional reconnaissance battalions light 37-millimeter antitank guns gave way to 75-millimeter towed pieces. Light reconnaissance vehicles gave way to heavier and more numerous armored cars. The eight wheeled, 234 series, armored cars appeared from 1943 on, and these incorporated many lessons learned in battle. The 234/2 "Puma" variant, with its fully revolving turret and 50mm anti-tank gun, is widely regarded as the best armored car produced by any nationality throughout the war.[46] As each of the four variants of the 234 entered service, evolutionary improvements in the vehicle increased its firepower, speed, and protection as a reflection of the realities of reconnaissance in sustained combat.[47]

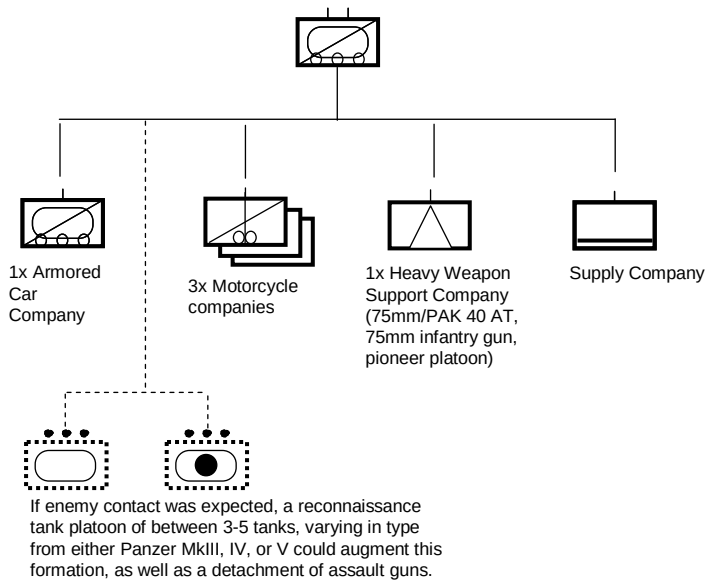
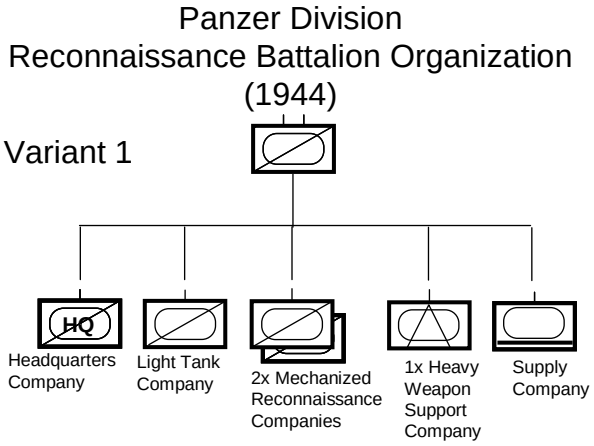


Figure 7. Augmentation of German Reconnaissance Battalions in the Midwar Period.

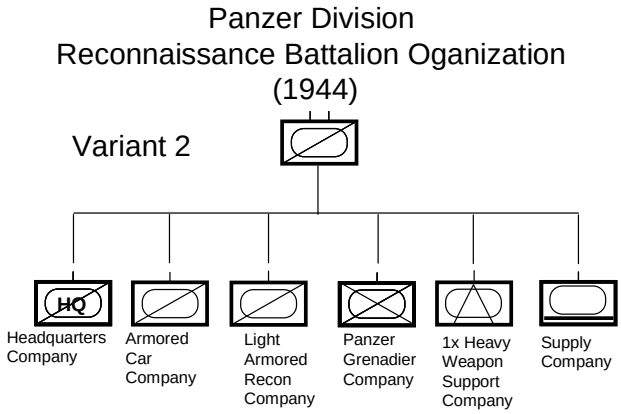
From late 1943 to mid 1944, operational requirements again shifted as Germany increasing found itself on the defensive. Reconnaissance missions more often became security missions, with reconnaissance elements conducting screen, guard, cover, defense and delay. In these missions armored car crews could find themselves engaging the enemy, while fighting for information or time for the friendly main body.[48] These evolving battlefield circumstances prompted another round of changes in German reconnaissance organizations. German industry had also retooled toward a war footing in 1942 and by 1944 this effort began to pay off; a massive reorganization of its panzer divisions then occurred to take advantage of this surge of new equipment. The armored reconnaissance battalions of the panzer divisions were no exception, as their tables of

organization and equipment finally grew to their largest size of the war. New reconnaissance battalions incorporated four companies of light tanks and new, up-armored and up-gunned half-tracks (see figures 8 and 9). Additionally, many of the reconnaissance platoons assigned directly to the panzer battalions converted completely over to medium tanks.[49]



Battalion Roll Up	Luchs Light Tanks	Half tracks	Armrd Cars	20mm guns	75mm guns	80mm Mortars
HQ	0	10	16	13	3	0
Light Tank Company x1	16	0	0	16	0	0
Mechanized Recon Company x2	0	30	0	0-7	2	2
Armored Heavy Weapon Company	0	25	0	0	6	6
Totals	16	95	16	36-43	13	10

Figure 8. The Type 1944 German Reconnaissance Battalion,Variant One

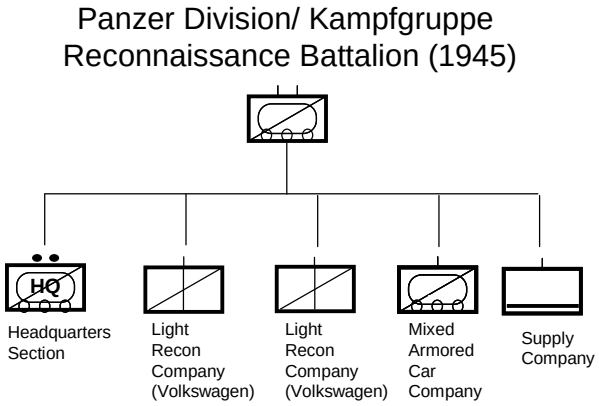


Battalion Roll Up	Half tracks	Armrd Cars	20mm guns	75mm guns	80mm Mortars
HQ	10	16	13	3	0
Armored Car Company	20	0	16	0	0
Light Recon Company x1	30	0	0	2	0
Pnzr Gndr Company	23	0	7	2	2
Armored Heavy Weapon Company	25	0	0	6	6
Totals	108	16	36	13	8

Figure 9. The Type 1944 German Reconnaissance Battalion,Variant Two

These fundamental shifts in the organization and roles played by German reconnaissance occurred in direct proportion to the reality perceived by the German Army by late 1944; they were locked in a war of attrition and this kind of warfare demanded much heavier reconnaissance organizations in order for them to survive and accomplish their missions. Unfortunately for the German Army, the eventual shift toward a full war-footing for its military industry in 1942 came too late. By 1944, the advances in armored vehicles, firepower and survivability in its reconnaissance platforms were simply irrelevant. The final “last gasp” of reorganization came in March 1945. All Panzer and Panzergrenadier Divisions that could no longer be individually distinguished by their unique compositions were blended together and lost any distinctive features. This austere

reality was reflected also in the disposition of the reconnaissance forces (see figure 10). [50] Most reconnaissance units lost up to seventy-five percent of their firepower, personnel, and equipment present in the most robust 1944 organizational model, and what remained was a thoroughly mixed and inconsistent organization in terms of capabilities.[51] There was simply not enough firepower around to be apportioned toward reconnaissance units. At any rate, the German Army found itself almost exclusively on the defensive by this point in the war, and the capability of its reconnaissance assets mattered less.



Battalion Roll Up	Half tracks	Armrd Cars	20mm guns	75mm guns	80mm Mortars
HQ	0	1	1	0	0
Armored Car Company	2	10	10	10	0
Light Recon Company x2	0	0	0	0	2
Totals	2	11	11	10	4

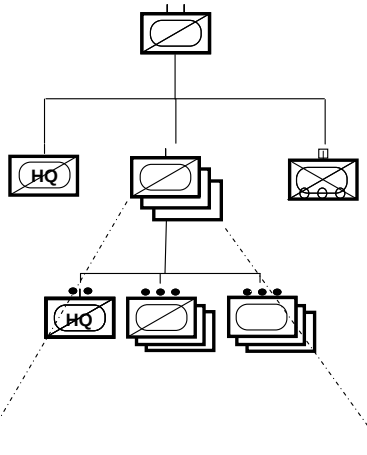
Figure 10. German Reconnaissance Battalions Reflect Attrition by War's End.

The opportunities for maneuver and counterattack by larger German mechanized units decreased precipitously the last year of the war, and by May 1945 the contest was decided. It was the futility of continuous defense and the resulting defeat that seems to have left the most lasting mark on the modern German Army. What remains salient in

Germany's armored force doctrine today is the offense. Its current maneuver doctrine, including its employment of reconnaissance, insists that armor should always be committed in the offensive role.[52] The *Bundeswehr* appears to have retained a strong distaste for static, positional warfare, and its maneuver doctrine reflects this. Even as the German Army transforms toward a lighter force, the organization of a modern German panzer division reconnaissance battalion continues to reflect an understanding that reconnaissance units must still possess an organic capability robust enough to fight for information.[53] To that end, the reconnaissance battalion still possesses an order of battle of mixed capabilities that includes tanks (see figure 11). [54] The operational and tactical lessons learned during World War II seem to have registered with the Germans quite well.

Modern German Panzer Division Reconnaissance Battalion (1990)

Battalion Roll Up	Leopard 2	Luchs	Fuchs
HQ	1	4	0
Infantry Team	6	0	10
Recon Company x3	3	10	0
Totals	34	34	10



Reconnaissance Company Roll Up	Leo 2	Luchs	Fuchs
HQs	0	1	0
Recon Platoon x3	0	3	0
Tank Platoon x3	3	0	0
Total	9	10	0

Figure 11. German Reconnaissance Battalions Today.

The German reconnaissance arm was far from perfect in World War II, but it demonstrated an enormous capacity to adapt throughout the course of the war. Negative experiences in the opening campaigns, resulted in significant transformations both at the organizational and tactical levels by 1943. Changes made to German reconnaissance and security forces throughout the rest of the war reflected the results of sustained combat, dwindling resources, and the recognition that missions outside of pure reconnaissance required better firepower and survivability than reconnaissance forces typically had been assigned. The lessons and scars collected by the German Army in World War II, with regards to maneuver warfare, left a lasting affect on the modern *Bundeswehr*. The necessity of having organizations with the capabilities needed for sustained offensive operations continues to affect both its panzer forces and its reconnaissance organizations as they are configured today.

Even more important are the implications that both the German and American World War II experiences have on the US Army's ongoing efforts at transforming its current cavalry organizations. If the United States is to avoid making the same mistakes the US Army and German Army both made at the beginning of World War II, then it would do well to pay attention to the painful lessons each army learned regarding the non-negotiable requirements enforced upon its World War II reconnaissance organizations. First, reconnaissance was not ever divorceable from security. Pure reconnaissance, as a mission conducted in isolation from other violent combat conditions, was a rare occurrence. Second, mechanized cavalry units had to retain the ability to fight for information to accomplish their missions; whether these missions were originally specified as reconnaissance or security was irrelevant. The requirements for protection

and firepower on armored formations, discovered by both armies in their constant fight for information, are still valid today on a high intensity battlefield. Given the failure of by both German and the US armies to succeed in going fast, light, and stealthy in the 1940s, the US would be wise to examine the wisdom of trying this again. Allowing cavalry units to settle on a "reconnaissance only" mindset is a dangerous proposition, especially if they sacrifice protection for speed and hinge their battlefield success entirely upon leaving all the killing to someone else.

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CHAPTER 3

US CAVALRY EXPERIENCES IN ASYMMETRICAL CONFLICTS

As the previous chapter showed, armored cavalry and reconnaissance organizations evolved over the course of World War II to address the demands of conventional conflict. However, the role of armored reconnaissance and cavalry has not just been limited to operations on tidy, linear battlefields. Critical to any thorough study of armored cavalry reconnaissance and security operations is an examination of examples where these units operated in a non-contiguous, asymmetric threat environment. Two significant asymmetrical environments, from the American perspective, were the US experiences in Vietnam and the most recent operations in Operation Iraqi Freedom (OIF).

The Vietnam experience is valuable, because it shows how US mounted forces conducted a multitude of traditional and nontraditional cavalry missions against an insurgency. Though the concept of mounted operations in Vietnam runs counterintuitive to most historical accounts of jungle fighting, there were more than just a few examples in Vietnam where armored cavalry made a decisive difference. Unfortunately, many of these historical accounts are not widely known to many in the US Army's maneuver community.

Just as relevant to any discussion on the counter-insurgency environment are the recent US experiences in Iraq. These are valuable, because many of the cavalry operations conducted in the opening stages of the war in 2003 and in the counterinsurgency fight in its aftermath provide strong, recent arguments for the value of heavy cavalry. The 3rd Squadron, 7th Cavalry's, economy-of-force mission at the head of

3rd Infantry Division and the resilience of heavy armor in the streets of Fallujah stand as prime examples of this argument. The challenges experienced by many US tank and mechanized battalion commanders in protecting their vulnerable HMMWV scouts from direct fire and improvised explosive devices (IEDs) also lends credit to the need to reevaluate the utility of light wheeled reconnaissance forces.

Vietnam and OIF demonstrate that, even in low intensity, stabilization and reconstruction operations, the intertwined relationships between reconnaissance and security requirements still seem to apply. This chapter will explore these relationships**.** There are some clear trends that appear in each of these conflicts that clearly indicate how these two concepts relate to each other.

The American experience in Vietnam frequently demonstrated that tracked vehicles and robustly equipped and organized cavalry organizations could make significant contributions in matters of area and route security against an insurgency. Additionally, in an economy-of-force role, armored cavalry units did well as quick reaction forces, riding to the rescue against a wide range of threats, up to and including the infamous 1968 Tet Offensive. Interestingly enough, a popular belief did persist at the time that mounted maneuver forces had no place in Southeast Asia. This stemmed primarily from the experiences of the French in Indochina. Their Mobile Group 100, lightly armed and equipped with primarily with trucks and infantry, had only 10 light tanks and no additional organic firepower. Weak and vulnerable, it was not much of an armored or mobile force at all when compared to American armored cavalry concepts. The force was eventually destroyed in a series of ambushes. Mobile Group 100's actual failures, coupled with a good deal of myth, contributed to a perception, both before and

during the war, that mounted combat in Vietnam was impossible. Nothing, in fact, was further from the truth.[1] US forces would eventually put more survivable armored vehicles in country, with more firepower, over more varied types of terrain than anyone previously thought possible. The result was that the American experiences with mounted forces in Vietnam would eventually turn the poor French example completely around.

In addition to the ill-placed comparison with the lightly equipped French forces, there were several misconceptions regarding terrain. Much of Vietnam was in fact good maneuver country year round. Despite jungles and rice paddies, forty-six percent of Vietnam could be traversed by heavy tracked vehicles year round. Even in many of the areas subject to monsoon flooding, their trafficability was still upwards of ten months out of the year.[2] The popular conception of Vietnam's complete inhospitability to mounted operations at the time ultimately proved not to be true. Certainly seasonal limitations brought on by monsoons and areas of severely restricted terrain like the Mekong Delta prevented unlimited operations, but where US armor units could go they did go with often decisive results.

Despite being declared a reconnaissance force in all of the official doctrine of the era, armored cavalry in Vietnam was more widely used as another combat maneuver force.[3] The reasons why armored cavalry units often found themselves operating beyond their doctrinal role is illuminating. The balanced combined arms nature of armored cavalry made them attractive to senior leaders as a maneuver force. Cavalry's flexibility, firepower, survivability, speed of reaction, and capacity for independent operations had a decisive impact in the minds of commanders in the field. Terrain, the uncooperative nature of the enemy, and the concept of area warfare also all contributed to force

mounted forces into frequent combat action in Vietnam. Senior leaders, seeking a force presence required to deny certain wide expanses of territory to the enemy, looked to cavalry to secure these large areas.[4]

When the United States first sent armored cavalry forces to Vietnam, there were specific reasons, cited in terms of mobility and protection, why the US Army perceived a need for a robust tracked force. For years US advisors had worked with training and equipping South Vietnamese Army's (ARVN) mounted units and had concluded that wheeled reconnaissance assets lacked mobility and protection. By 1967, US advisors recommended enhancing ARVN mobility and survivability by replacing every one of their World War II vintage M8 armored cars with M113 armored personnel carriers.[5] The ubiquitous jeep found limited use in Vietnam as a reconnaissance platform for the United States, primarily because it lacked cross-country mobility and armor protection.[6] In the end, the US Army came to Vietnam with cavalry squadrons organized to do business in difficult terrain based on these educated observations. The M113 Armored Cavalry (ACAV) variant, the M48 medium tank, infantry platoons and air cavalry capabilities all came together in one powerful combined arms package. The average armored cavalry squadron's ground combat power in Vietnam dressed out with 27 tanks, 76 armored personnel carriers, and 3 mortar carriers.[7] Clearly this was a force that possessed enormous potential against enemy light infantry and guerrilla forces. This fact was not lost on division, brigade, and regimental planners, and the result of this was a wide ranging set of assigned missions for armored cavalry organizations that lasted throughout the war.

In day-to-day combat operations, US armored cavalry units typically performed one of three basic missions; convoy escort, route security, or area security.[8] While it could be argued that each of these missions still achieved specified zone, area, or route reconnaissance objectives, the central task and purpose of these missions was almost always to provide some form of security. When conducting route reconnaissance, the ACAV variant of the M113 found its calling as a purpose built ambush-breaker, providing the kind of intense automatic weapons counter-fire needed to break through the killzone and save otherwise doomed convoys.[9] Of additional note was the development of a practice known as the "thunder run": a heavily armed, force-presence patrol that usually included tanks and ACAVs. Technically a reconnaissance-in-force, the thunder run units would move frequently and randomly through areas known to be high traffic routes for the enemy. The intent was to keep routes clear by keeping the enemy guessing and off-balance throughout the zone. Each thunder run unit possessed the kind of protection and overwhelming firepower to deal decisively with any threat encountered.[10]

The effects of these missions were noteworthy. Various captured North Vietnamese Army (NVA) documents attested to the overwhelming fear common to NVA and Vietcong (VC) units when confronted with these unpredictable armored thrusts. The enemy was often reluctant to engage tanks and any US units riding along with them. NVA accounts specified the M48 tanks and their anti-personnel "beehive" rounds as particularly feared and detested.[11] The firepower and mobility enjoyed by armored cavalry units in Vietnam clearly found a use and its effect on enemy morale was telling.

When required to conduct actual dedicated reconnaissance missions, armored cavalry squadrons also worked closely with their organic rotary wing scouts as a key

command and control link and situational awareness enabler. Aero-scouts were able to spot threats and either talk the ground troops to the enemy for destruction or talk them around the force to sustain squadron maneuver tempo. Colonel George S. Patton III stated flatly that the entire success of the 11th Armored Cavalry Regiment in Vietnam was due exclusively to the skill and dedication of it nine warrant officer aero-scouts.[12] The clever integration of aviation and ground troops together into the squadrons made a difference in the scattered and decentralized nature of what became conceptually known as area warfare. The presence of air cavalry alongside the ground troops often provided the decisive edge when enemy contact was made.[13]

The effectiveness of armored cavalry formations in Vietnam as a mobile quick reaction force was quite clear. Armored cavalry units were successful wherever committed. Armored cavalry formations possessed all of the necessary speed, mobility, protection, and firepower required to secure the most vital of American and South Vietnamese assets. These capabilities were best demonstrated when numerous US cavalry formations where able to cordon, contain and destroy large enemy formations during the Tet Offensive in 1968. In the opening night of the offensive, five entire US cavalry squadrons successfully converged on Saigon to perform a protective perimeter around the city, despite the fact that some units had to move over 70 miles in limited visibility.[14] At Bien Hoa, one cavalry troop shot its way through two ambushes to ultimately arrive at the air base just in time to save it. The armored cavalry's actions at Bien Hoa air base defeated waves of Vietcong attacks without allowing a single successful penetration of the base's outer defenses.[15] Within 24 hours the key cities of Saigon, Bien Hoa, and Long Binh were eventually "ringed in steel" by a force of over

500 American armored cavalry vehicles.[16] This cordon of mobile and lethal armored cavalry units was absolutely devastating to the NVA and VC forces, who could not match the mobility, flexibility, and firepower of US armored cavalry units. Casualties inflicted on the enemy were of such a magnitude that many leaders in the victorious cavalry squadrons wondered how the American media could honestly report Tet as an American defeat.[17] By at least one account, the enemy was stacked in piles of dead "like proverbial cordwood" all along the unit perimeter.[18]

The armored cavalry proved its worth as a mobile reserve exhibiting defensive and offensive capabilities well beyond that of any similarly sized light infantry units. The firepower brought to bear by these armored cavalry organizations proved to be the deciding factor during the Tet Offensive. The defenses of Bin Hoa and Ton Son Nhut airbases were brought to successful conclusions by the sheer force of cannon and machinegun fire poured into the attacking enemy. These efforts were, by all accounts, an overwhelming display of firepower that made the decisive difference. For the desperate defenders of many of these key installations, the armored cavalry arrived just as the enemy was close to breaking through in many places.[19] Without the presence of the armored cavalry, it is likely that many of these hasty perimeter defenses would have collapsed and the consequences of this failure would have been severe.

Despite these success stories, mounted forces in Vietnam were not without their challenges. Complacent and inattentive armored formations were very vulnerable to ambush, despite their armored protection.[20] Seasonal monsoon weather conditions could limit mobility for the heavier firepower platforms, and even the most cautious of units could still lose vehicles to mine strikes. One of the most notable challenges was the

integration of new systems into units in the field. The integration of the M551 Sheridan into the cavalry force is a vehicle that still seems to suffer from mixed reviews, depending on which Vietnam cavalry veteran one interviews.

Despite glowing reviews by some advocates, the aluminum Sheridan was not without its detractors. Not withstanding complaints about shoddy electronics, engine overheating, and a weak transmission, the M551 also lacked the weight of the M48 required to effectively break brush in the jungle.[21] More importantly, the Sheridan, with its soft metal and semi-combustible caseless ammunition, lacked the survivability needed to counter mine strikes and RPGs, two of the most common threats in Vietnam. The initial results of this weakness in protection were two-fold. First, nearly any penetrating impact caused the Sheridan to burn. Second, once rumor got out that they were not survivable, many Sheridan crews began to regard them as death traps.[22] The US Army did eventually weld additional steel armor plating to the undersides of all Sheridans going to Vietnam.[23] Unfortunately, damage to the vehicle's reputation was already done prior to its mass fielding. At least until measures to enhance survivability were put in place, many crews either rode on top of the vehicle, as they did with aluminum M113 ACAVs,[24] or bailed out of the track after the first hit.[25] This naturally reduced the vehicle combat effectiveness, as sudden loss or abandonment of the Sheridan left all those who otherwise relied on the Sheridan's firepower for support on their own to conclude the engagement.

What made the Sheridan a success to its initial advocates in Vietnam depended at least in part to whom it was first issued. The 11th ACR drew its M551s to replace their ACAVs, not to replace their M48s. They thus retained their jungle busting abilities and

the firepower of their medium tanks.[26] If compared to the M113 ACAV, then the enthusiasm for the M551's greater firepower in the 11th ACR is certainly understandable. By contrast, 3rd Squadron, 4th Cavalry drew its Sheridans to replace its M48 medium tanks on a one-for-one basis, thus they replaced their heavy armor for a vehicle that was slightly less capable.[27] To make matters worse, it was 3rd Squadron, 4th Cavalry that also experienced the vehicle's first mine strike on 15 February 1969, which resulted in an ammunition fire and a total loss of the vehicle. Word quickly circulated through the 4th Cavalry that the Sheridan was extremely dangerous, ultimately even reaching the training base back in the United States.[28]

What seemed to be the linchpin in the final decision to fully field the Sheridan came after two significant demonstrations of the vehicle's firepower, the first on 23 February 1969 and the second on the night of 10 March 1969. In each incident Sheridans were able to catch a sizeable number of enemy troops in the open and kill them with devastating 152mm canister fire. The canister or "beehive" round was a 152-millimeter anti-personnel round that, once fired, created a giant shotgun effect against dismounted infantry. This capability was highly useful against concentrated groups of attacking VC and NVA infantry. By the end of the testing period both, the 4th and 11th Cavalry had eventually concluded the M551 had greater mobility, firepower, range, and night-fighting ability than the vehicle it replaced. The army made the decision to fully deploy the vehicle and, by 1970, more than 200 Sheridans had made it to Vietnam.[29]

In the final analysis, the story of the Sheridan's fielding in Vietnam provides a cautionary tale toward fielding survivable armored platforms for armored cavalry organizations. It was certainly better than the ACAV, in the one-for-one upgrade of

aluminum armor. However, for many armored cavalrymen in Vietnam, there was little comparison between the stand-and-fight M48 medium tank and the light and fragile M551. Replacement or augmentation of the M113 ACAV might have been justified, but substitution of this platform for the dependable M48 was a tough sell to many who had come to appreciate its reliable capabilities.

The US Army also experienced some failures in experimenting with purely technological solutions to its reconnaissance and surveillance requirements. The US discovered that reliance on high-technology to answer reconnaissance needs did not work without the real presence and integration of the human element. Deployed sensors did not work in Vietnam for a multitude of reasons, including poor training, poor maintenance, and bad environmental conditions. Though some occasional successes did occur, sensors were only able to truly achieve complete reliability when used in conjunction with foot and mounted patrols, other redundant sensors, and aerial reconnaissance platforms.[30]

In addition to revisiting lessons on firepower, protection and mobility requirements, the experience of armored cavalry in Vietnam echoed many of the lessons the US learned in World War II regarding the elastic nature of cavalry operations. Once again, instead of purely focusing on reconnaissance and surveillance, armored cavalry in Vietnam found itself operating across a broad spectrum of missions. Its presence on the battlefield, whether conducting convoy security, isolating and destroying pockets of trapped NVA, or rushing to defend the perimeter of a besieged airbase, was as a combat force that typically operated far beyond the scope of simple observation and reporting. The official findings of the Army's evaluation of Mechanized and Armored Combat Operations in Vietnam (MACOV) study group are illustrative of this point. "Armored

cavalry units employed in roles previously given to tank or infantry battalions performed superbly, well beyond their traditional reconnaissance, security, and economy of force roles."[31]

In Vietnam, as in World War II, there was rarely any distinction between reconnaissance and security for armored cavalry units. The distinction between the two wars seems to be merely in the nature of the threat; conventional verses unconventional forces. What remained the same was the need for units to be equipped and prepared to fight and survive, no matter what the assigned mission may transition into once outside the gate. In retrospect, US armored cavalry experiences in Vietnam simply reinforced lessons that first appeared in World War II regarding firepower, protection and mobility. Well protected, well armed tracked vehicles, including tanks (M48s), were often critical in the execution of force presence patrols and route security. Light mounted recon (M113s) did almost no reconnaissance but acted as another maneuver force alongside the tanks. The recurring theme of mounted reconnaissance and armored combat in Vietnam pointed to one simple reality; security was inseparable from reconnaissance at every level. Furthermore, once contact was made, firepower, survivability and mobility were critical to the success of armored cavalry organization. Units that neglected these truths did so at great expense.

The American experience in Operation Iraqi Freedom (OIF) so far seems to reinforce and confirm historical conclusions regarding requirements for survivability and firepower in cavalry units. The baseline conclusions in both the maneuver phase of the war and the follow-on struggle against the insurgency all point to one thing: despite the growing capabilities of unmanned aerial vehicles, other electronic sensor systems, and

emerging battle-command and situational awareness enablers, reconnaissance units in OIF still rely on soldiers in contact with the enemy to adequately answer information requirements. Huge gaps existed in the initial invasion in 2003, both in volume and quality of information available between theater, corps, and division level intelligence. This forced brigades to seek information from the bottom up rather than top down.[32] No matter how sophisticated the technical means of gathering information, the real picture only came from human eyes on target.[33] This reality continually forced soldiers to make contact to gain information.

Information gathering systems were certainly an enabler on the open battlefield, "but speed and information superiority became less decisive when combat occurred at closer range. [In complex urban terrain], the Abrams and Bradley proved decisive with their advantages in protection, mass, and explosive firepower."[34] To accomplish reconnaissance missions reconnaissance assets have to be robust enough to fight and survive in prolonged contact because sensor systems are not yet able to do the job alone. Security requirements still remain imbedded in every reconnaissance mission, despite the best efforts to separate the two. The answer to these battle-tested requirements still seems to be legacy maneuver systems, not robotic sensor systems attempting to clinically gather data from positions of relative safety.

In the opening drive toward Baghdad in 2003, two cavalry themes reemerged that have been repeatedly discussed in this study. First, operational security requirements were inseparable from any form of reconnaissance performed by the leading cavalry and reconnaissance organizations. Because the initial mission of the 3rd Infantry Division called for the seizure of the Karbala Gap before the Iraqis could discern what was

happening, the division's movement had to be conducted as rapidly as possible.[35] For the 3rd Infantry Division's lead reconnaissance and security force, the 3rd Squadron 7th Cavalry, this operational pace translated into a rate of advance so rapid that detailed reconnaissance was impossible. The traditional cavalry role of economy-of-force then reappeared as 7th Cavalry's primary mission set, as the squadron executed a movement-to-contact well forward of the division's lead brigades. Rather than infiltrate forward to answer carefully selected reconnaissance objectives, 3rd Squadron, 7th Cavalry essentially acted as a forward detachment for the division, securing key objectives well ahead of main body and handing them over to follow on brigades. Whether racing ahead to make contact with the Fedayeen, seizing key terrain in advance of the division main body, or containing enemy forces on the east side of the Euphrates, the troopers of the 7th Cavalry were among the first coalition troops to make contact with the enemy and the first to set the critical conditions needed for the success of follow-on friendly forces.[36] Reconnaissance was certainly inherent within the context of this mission, but this reconnaissance occurred in association with both security and offensive mission sets.

The second theme that reemerged in OIF was the necessity for protection and firepower in cavalry platforms. Deprived of their ability to use stealth to infiltrate through zone, brigade reconnaissance troops and battalion scout platoons rapidly deduced that their HMMWV mounted scouts were inadequately protected to perform traditional reconnaissance in the face of enemy resistance. As tactical commanders assumed every movement was now a movement to contact, they elected to "give up their eyes rather than risk losing them."[37] Task Force 2-69 Armor confronted this reality during the March-April 2003 attack into Iraq, when it was forced to move through the brigade

reconnaissance troop and take over as the lead combat element. The fact that enemy contact had become more likely pushed the wheeled scouts into secondary flank or rear security roles.[38] Forward reconnaissance was then conducted by more heavily armed and better protected combined arms company teams.

When confronted with counter-attacking enemy tanks, "technical vehicles," or swarms of RPG wielding paramilitary fighters, there simply was no substitute for the firepower and resilient protection of the M1 Abrams and M3 Bradley combination. The difference these "hunter-killer" teams made, as the leading friendly force, was telling.[39] During the sandstorm from 25 to 28 March 2003, the thermal sights, protection, and overwhelming combined firepower of these legacy mechanized systems enabled American forces to hold their ground against waves of attackers that would have likely overwhelmed the US Army's lighter reconnaissance organizations. Thinly protected and weakly armed Scout HMMWVs would not have been able to survive thousands of attacking Fedayeen, as they do not do now in Iraq, nor would they have been able to safely lead Task Force 2-70 Armor from firefight to firefight as the 3rd Infantry Division and the 101st Airborne attempted to consolidate their isolation of An-Najaf. What the US Army did in its march to Baghdad in 2003 took Abrams and Bradleys at the point of every critical endeavor; not light reconnaissance vehicles.

The transition from major combat operations to stability and reconstruction operations (SRO) in Iraq did nothing to abrogate the requirements of cavalry units witnessed in the opening phases of OIF. Once the counterinsurgency fight began, the nature of the non-contiguous threat, aggravated by the urban operational environment, only served to reemphasize lessons already learned regarding firepower and survivability

of cavalry and reconnaissance platforms. The limitations of HMMWVs in absorbing the insurgency's primary threat, the improvised explosive device (IED), put the M1 tank and M3 Bradley back into the spotlight as the preferred maneuver element for the combined arms patrol.[40] Once in contact with insurgent forces, whether simply on daily patrols or leading the effort to seize Najaf and Fallujah, scout platoons routinely called armored assets forward to finish their fights decisively. Stryker reconnaissance organizations have demonstrated the capacity for wheeled reconnaissance assets to succeed against asymmetric threats, but this appears to be a function both of access to precision fires and of the organic presence of significant dismounted capabilities, better sensor systems, and better survivability than the M1114 provides. Ultimately, OIF has provided the opportunity to demonstrate the capabilities of some new reconnaissance systems, but the demands of fighting against the insurgency have done more to prove the necessity of legacy heavy platforms than to validate the ascendancy of any transformational concept or system.

The crux of the US Army's cavalry experience in OIF seems to be a reaffirmation of the historical trends discussed in this study. Though light scouts have routinely conducted route and zone reconnaissance, area security, and other traditional cavalry missions throughout the duration of the Iraq mission, they seldom have done it alone. Light cavalry HMMWV platoons both in the opening phases of the war and during the counter-insurgency efforts have required integration with M1 and M3 assets and the development of specific tactics, techniques, and procedures to leverage these assets in the fight for information. Close coordination with armor assets continues to be required for

light scouts to survive contact and to seize and control dominant urban terrain throughout their normal day-to-day operations.[41]

When light scouts have found themselves in the vanguard of offensive operations, such as during the 2003 drive to Baghdad or more recently the November 2004 seizure of Fallujah, the requirements for reinforcement and standoff become non-negotiable. The experience of the 3rd Brigade, 1st Infantry Division brigade reconnaissance troop (BRT) during the final siege of Fallujah provides a snapshot of what is required. Though initially tasked to conduct a screen line along the city's eastern flank, the 3rd Brigade BRT was augmented by an airforce tactical air-control party (TAC-P), an artillery forward observer, two M1A2 Abrams tanks, and two M3 Bradleys. From the beginning of the operation, the BRT's mission moved well beyond simple reconnaissance and surveillance. For days the BRT conducted counter-sniper operations, called for fire against deep targets, and conducted support-by-fire operations to shape the conditions for assaulting forces. Once clearing operations inside Fallujah began in earnest, BRT scouts were then committed in more direct, infantry-type missions. All of these missions required a combined arms approach and a scope of execution well beyond simple observation from a distance.[42] For all of the intellectual emphasis in current doctrine on the necessity of focusing on reconnaissance as the lone mission of cavalry units, the reality of scout troop missions in Iraq belies a much different set of truths.

Despite the best efforts of transformation advocates to remove rotary wing assets from cavalry organizations, the continued integration of scout and attack helicopter assets in Iraq proves necessary and valuable. Time and again, the control and synchronization of OH-58s and AH-64s with ground forces has made a critical difference in the ability of

US forces to assess, shape and dominate against insurgent forces. The effectiveness of these new habitual relationships between aviators and ground commanders, as was originally common in the division cavalry squadron, has rekindled an interest in why this concept was important in the first place. Rotary wing aviation in Iraq seems to be potentially the greatest untapped resource in Iraq's urban environment.[43]

For some advocates of transformation, the greatest promise for the future seems to be resting on the performance of Stryker units in Iraq. Unfortunately, any success stories with Strykers in Iraq must be acknowledged for their limitations, as they are framed by the low intensity conflict from which they are taken. OIF is no longer a conventional high-intensity conflict, where Strykers would be forced to confront a well equipped and highly mobile maneuver force. Stryker Reconnaissance Surveillance and Target Acquisition (RSTA) squadrons do routinely set the conditions for their success in OIF through information dominance, but this has occurred in a slower paced environment where insurgents do not possess the ability to seize and retain the initiative not do they have the ability to engage the Stryker brigades in their entirety and all at once.

The Stryker equipped reconnaissance squadrons accomplish their successes in OIF through their access to organic sensor systems, the presence of imbedded human intelligence (HUMINT) collectors, and their ability to leverage their own robust dismounted infantry and scout capabilities to control terrain. The Stryker reconnaissance vehicles have proven more survivable than their M1114 mounted cousins, [44] and their access to joint precision fires has allowed the RSTA squadrons to make up for some of their current lack of direct fire capability.[45] Unfortunately, what seems to make the Stryker equipped RSTA squadrons so successful in SRO in Iraq is their access to assets

and capabilities that exist well outside the capabilities of HMMWV scout platoons. The new Heavy Brigade Combat Team (HBCT) and Infantry Brigade Combat Team (IBCT) reconnaissance organizations do not have anything close to what Stryker RSTA can access. Without equal access to the same RSTA capabilities organic to the Stryker brigades, a comparison with HBCT and IBCT reconnaissance units it is simply not a valid evaluation.

The US Army should be cautious not to make too much of the Stryker's successes in OIF. Proving that Stryker equipped units will work in a SRO environment does nothing to prove that they will also succeed in a high-intensity conventional conflict, nor does it prove that other dissimilarly equipped modular recon squadrons are just as effective. Additionally, even the RSTA squadron's sensor assets have their limitations. Prophet signal intercept and collection systems can be overwhelmed by an environment where nearly everyone has a cell phone. Stationary motion sensors such as REMBASS still require someone to emplace them, secure them and relocate them as battlefield conditions change. UAVs, though promising and improving every day, still have limits. UAV flights are sometimes delayed or cancelled due to congested transmission frequencies. Different UAV platforms cannot transmit data to each other nor can they completely integrate with other ground sensor systems. Additionally, poor weather can often inhibit UAVs from flying and impair their capabilities to spot targets.[46] Even if UAVs were to suddenly have all of these deficiencies redressed, their still exists the problem of generating the required bandwidth to handle the overwhelming ISR imagery flow. With over 750 UAV systems currently operating in Iraq, the problem of downloading and processing large UAV data feeds is both real and growing.[47]

From the observable successes of Stryker equipped units in OIF, there seems to be one emerging theme on transformational warfare. Success is predicated on system efficiency rather than effectiveness. In OIF the successes of Stryker equipped RSTA units in Iraq have rested on several critical systemic requirements. First, information superiority or dominance must be achieved every time in order to avoid surprise. Second, the availability of precision weapons must be consistent and overwhelming at the onset of every engagement every time. Lastly, RSTA units must maintain absolute control over the time and location of every fight. Unfortunately these requirements seem to run up against the empirical evidence observed in the more chaotic historical examples like Mogadishu, Tora Bora, or Fallujah.[48] Over-reliance on flawless situational awareness is a dangerous precedent to establish and is not supported by the weight of evidence present in most combat conditions.

After over three years of war in Iraq, the baseline conclusions on the nature of cavalry operations in that theater all point to one thing. Despite the growing capabilities of unmanned aerial vehicles, other electronic sensor systems, and emerging battle-command and situational awareness enablers, reconnaissance units in Operation Iraqi Freedom still rely on soldiers engaging with the enemy to answer information requirements. These soldiers continue to require armored assets that possess mobility, protection, and firepower adequate to address all threats. Light cavalry forces have never been enough. Additionally, success in Iraq has resulted from the integration of ground combat power, rotary wing aviation, and the frequent use of joint precision fires, not exclusively one or the other. The one dominant theme that consistently appears in Iraq is

the need for US ground forces to continue to tailor and combine ever more firepower and capability at increasingly lower levels of organization than is practiced doctrinally.[49]

When compared to the conventional armored cavalry operations of World War II, the US Army's experiences in Vietnam and Iraq might seem, on their surface, completely separate in their context. Upon closer examination, this study shows that this does not seem to be the case at all. Even in low intensity, stabilization and reconstruction operations, the intertwined relationships between reconnaissance and security requirements still seem to consistently apply. There are some clear trends with regards to the need for firepower and protection among cavalry platforms that does not change when circumstances shift from conventional, linear battlefields to non-contiguous and asymmetrical threat environments. Cavalry units must retain the ability to fight for information in all environments, as pure reconnaissance is historically a rare occurrence. The appearance of sophisticated sensors and modular transformation among cavalry units has done much to enable information flow and enhance situational awareness, but has done little to dismiss any of the persistent requirements of cavalry organizations to fight and survive on the battlefield.

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CHAPTER 4

ANALYSIS AND IMPLICATIONS OF CURRENT RECONNAISSANCE ORGANIZATIONS AND CONCEPTS

In its previous chapters, this study has examined strong historical evidence demonstrating the inseparable relationship between reconnaissance and security missions on the modern battlefield. The performance of both German and American armored cavalry organizations in World War II illustrated the consequences of attempting to divorce firepower and survivability requirements from reconnaissance units and the costly results of presuming too much in the qualities of light and fast. Both armies reintroduced survivable cavalry platforms equipped with adequate offensive firepower, reemphasizing the requirements that must be met to successfully fight for information on the modern battlefield. The experiences of the US Army's armored cavalry in the asymmetrical threat environments of Vietnam and Iraq further demonstrated the persistent validity of these same conclusions, especially in the face of unconventional adaptive threats. Unfortunately, without acknowledging the significant lessons that these historical examples demonstrate, the US Army has embarked upon an ambitious plan to change everything in its reconnaissance forces all at once, without outlining or qualifying many of the sweeping assumptions it has made.

Much of the innovations in the Objective Force concept, and in the most recent emerging doctrinal concepts all hinge on one thing; the ability of leading reconnaissance units to make contact with sensor systems beyond the range of enemy indirect and direct fire contact. In theory, this would allow objective force units to "develop the situation out of contact"[1] prior to the final commitment of maneuver units to a direct assault. The

Future Combat System (FCS) proposals have indeed outlined an impressive set of concepts and capabilities in slide presentations and videos. What is troubling to many in the midst of this debate is that the US Army has already committed to a total modification of its cavalry organizations without possessing any of the proposed future systems it needs to ensure success. There are no high-tech, beyond-line-of-site (BLOS) weapons systems currently fielded in 2006. There may be a hand full of remote controlled robots helping soldiers explore caves in Afghanistan, but the legions of self-guided, robotic ground reconnaissance platforms promised in the FCS concept have yet to materialize. There are also few sensor systems that do not currently require humans to emplace, secure, and relocate them continuously as battlefield conditions change. Ultimately, what exists in the Objective Force and FCS promotional videos remain largely proposals. The experimental systems that actually do exist are not in sufficient numbers to enhance the capabilities of even one currently existing reconnaissance squadron.

Conventional capabilities are under-manned as well. To a newly formed heavy reconnaissance squadron, attempting to define today how it is supposed to look and function in the future, the Recon Surveillance and Target Acquisition concept, as defined in FM 3-20.96 and discussed in Chapter One, is but a name only. The sophisticated sensors and target acquisition systems present in the Stryker BCTs are not yet present in the HBCT and IBCT reconnaissance squadrons. Depending on the BCT to which they have been assigned, any new reconnaissance squadron in the US Army can look forward to receiving anywhere from one-half to none of the new equipment that FM 3-20.96 says it is supposed to possess. A recent examination of units at Fort Hood, Texas is illuminating. As of February 2005, 7th Squadron, 10th Cavalry's reorganization efforts

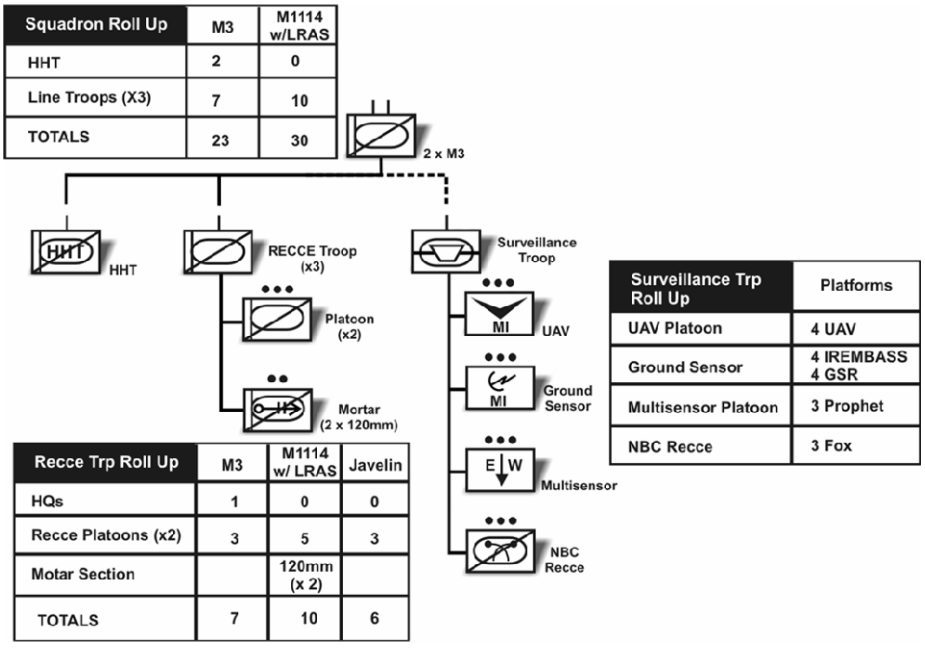
revealed reconnaissance troops configured with less than half of the M1114 HMMWVs required by Modified Tables of Organization and Equipment (MTOE).[2] Some newly formed reconnaissance squadrons have even fewer systems. As of January 2006, 4th Squadron, 9th Cavalry had only one ground troop's worth of HMMWVs and these were older M1025 variants.[3] Squadrons struggling with fielding the bare number of systems are thus not even able to train adequately with emerging reconnaissance doctrine. When one searches for the presence of UAVs or any other sophisticated RSTA asset within the recently transformed reconnaissance squadrons, one discovers there is not a single reconnaissance unit in the US Army that physically possesses such equipment in accordance with the original proposed tables of organization and equipment. If the acquisition and reallocation of these simple conventional weapons systems is so seemingly difficult, one has to wonder how the army proposes to field the even more expensive FCS.

To be fair, the RSTA squadrons assigned to the six Stryker BCTs outlined in the US Army's transformation program actually have their sensor troops imbedded inside the reconnaissance squadron. However, the twenty HBCT and eighteen IBCT reconnaissance organizations have nothing of this sort permanently assigned. Rather, the brigade troops battalion (BTB) typically retains these assets, and the BCT headquarters dictates all of their planning and tasking. Critical *Objective Force* systems such as UAVs, ground surveillance radar (GSR) systems, and other signal intercept equipment, are not positioned alongside the ground cavalry they were originally designated to support. The most immediate consequence of detaching these critical target acquiring assets from the reconnaissance squadron and giving them to the brigade headquarters is that

reconnaissance squadrons do not directly control the very forward-looking equipment they require to do their jobs as originally proposed. In an act of functional redundancy, the organizations and innovative systems specifically assigned to perform reconnaissance for the brigade commander have been separated from one another. The reconnaissance squadrons are now blind to the direct sensor feed that their ground troops so desperately need to make contact out of direct fire contact and develop the situation. In the strictest doctrinal terms, there is no actual target acquisition by the reconnaissance squadron until someone makes physical enemy contact. As a result, target handover between the reconnaissance squadrons and the combined arms battalions (CABs) cannot occur until someone in a ground reconnaissance troop physically guides them forward, most likely while under fire.

For all of the optimistic discussion in the latest version of FM 3-20.96 about making contact with sensors and developing a situation out of direct fire contact, there is little difference now between the realities of brigade reconnaissance squadron techniques and the capabilities of World War II ground reconnaissance. Other than the fact that reconnaissance squadrons no longer have the organic helicopter assets or armored firepower formerly common to division cavalry, cavalry scouts must still execute their reconnaissance and security missions much as they have for the past sixty-five years. As a result, the newest reconnaissance squadrons no longer possess the critical assets historically required to bail themselves out of trouble once it is encountered. Wire diagrams, taken from original reconnaissance squadron concept slides in 2003, depicting the typical layout of both the light and heavy recon squadrons illustrate a dotted line that indicates nonownership of the sensor troop at squadron level (see figure 12).[4]

HBCT Recon Squadron Concept (2003)

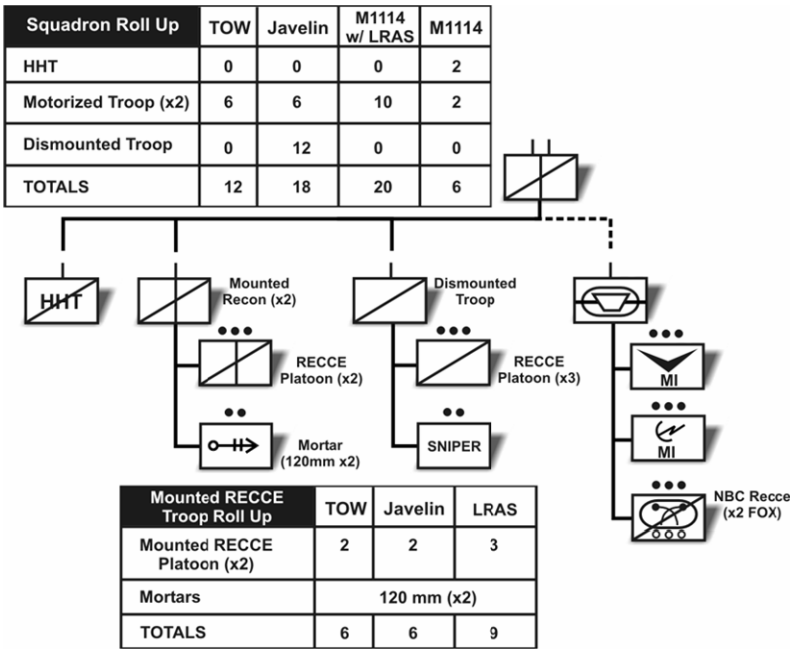


Squadron Roll Up	M3	M1114 w/LRAS
HHT	2	0
Line Troops (X3)	7	10
TOTALS	23	30

Recce Trp Roll Up	M3	M1114 w/ LRAS	Javelin
HQs	1	0	0
Recce Platoons (x2)	3	5	3
Motar Section		120mm (x 2)	
TOTALS	7	10	6

Surveillance Trp Roll Up	Platforms
UAV Platoon	4 UAV
Ground Sensor	4 IREMBASS 4 GSR
Multisensor Platoon	3 Prophet
NBC Recce	3 Fox

IBCT Recon Squadron Concept (2003)



Squadron Roll Up	TOW	Javelin	M1114 w/ LRAS	M1114
HHT	0	0	0	2
Motorized Troop (x2)	6	6	10	2
Dismounted Troop	0	12	0	0
TOTALS	12	18	20	6

Mounted RECCE Troop Roll Up	TOW	Javelin	LRAS
Mounted RECCE Platoon (x2)	2	2	3
Mortars	120 mm (x2)		
TOTALS	6	6	9

Figure 12. Original Modular Brigade Reconnaissance Squadron Concepts in 2003 *Source:* United States Army, "ISR Organizations and Assets," Armor Captains Career Course Presentation, 1 May 2004.

It seems the sensor troops that were to have sufficed as a replacement for organic combat power in the original FCS proposals are not controlled by the very reconnaissance forces that were to depend upon them. So long as the sensor systems remain controlled by brigade headquarters, the concept of sensor-to-sensor target handover, in most cases, will require constant coordination through multiple echelons of command. Without physical possession or operational control of sensor assets at the reconnaissance squadron level, the new HBCT and IBCT reconnaissance organizations technically do not even qualify to be labeled as "RSTA," because they have no ability to acquire targets beyond the short range capabilities of normal ground recon troop assets. The much vaunted application of joint and precision fires, proclaimed in the latest version of FM 3-20.96 as a substitute for organic combat power, is thus not likely to occur efficiently if at all.

The advocates of change promised RSTA for all BCTs, and wrote as much in the original Objective Force concepts and the army's current doctrine. Unfortunately, as of 2006 the US Army has been delivered only under-equipped HMMWV and Bradley platoons with no significant technological innovations beyond what they enjoyed already. To a scout operating on the ground in Iraq, old-fashioned protection and firepower are still required to survive, while continuing to fight for information. Concepts and interim organizations do not keep scouts alive, enable their performance at any level, or answer any of their assigned intelligence gathering requirements. From the perspective of today's cavalry scout, the FCS might as well be delivered 250 years from now.

Williamson Murray and Major General Robert Scales, in their book *The Iraq War*, label those theorists who seem to be frenetically driving transformation efforts as

"futurists."[5] These futurists seem to advocate a blind acceptance of technology as a virtual guarantor of certainty on the battlefield, ignoring the activities of the opposition and the constraints of fielding. Thus, they ignore the enduring clear requirements for soldiers to survive, fight for information, and report intelligence on today's complex battlefield. The futurists' arguments are ahistorical, as both Murray and Scales' book and this study clearly demonstrate, but that has not diminished their continuing impact inside the Pentagon.

The futurists who continue to push these concepts achieve success using two techniques. The first technique is to avoid rigorous testing of their concepts, prior to dismantling the organizations and equipment the US Army relies on today to accomplish its missions. Written throughout their vacuous, theoretical pontifications, words like "digital" and "modular" trump "survivable" and "proven." In the futurists' world, merely reshuffling units and scrambling brigades is enough for now. Once the current doctrine and equipment is gone, there is no option left but to go forward. They presume the US Army can dismantle every single traditional cavalry organization to pave the way for systems that do yet not exist. The futurists presume the US Army can abide being a little weaker while it waits for the FCS to appear through a trickling, painfully slow feed called spiral development and fielding. Additionally, the futurists get to set the timeline for when the army gets the new tools and weapons. Currently commanders in the field, whose organizations ultimately pay the consequences for being left hamstrung and vulnerable in the midst of an ongoing war, are not actively involved in doctrine and concept development.

The second technique the futurists use is to label any objections to the FCS or their mantra of fast and light as ignorant, stubborn, and traditionalist. In which case, these objections are irrelevant and thus unworthy of having their very real concerns seriously addressed. This is a convenient intellectual cop out, which has left what should be an open, professional discussion on these matters strangely silent. It is politically correct to discredit the Legacy Force in favor of unconditional acceptance of the FCS and institutionally unacceptable to defend past doctrine and concepts. Colonel (retired) Douglas R. Macgregor calls it "data-free analysis," a peculiar environment in Washington where groundless speculation is indulged often enough to result in analysis-free decision making by senior leaders.[6] This phenomenon explains the apparent absence of open debate on transformation and serious consideration of issues of survivability and performance.

The more important question to ask in assessing whether or not the new reconnaissance squadrons actually possess what they need to fulfill the needs of their brigades is "at what level of proficiency does the army honestly expect these squadrons to perform their reconnaissance and security missions?" The HBCT and IBCT reconnaissance squadrons are certainly more capable than the old brigade reconnaissance troops (BRT), but they are profoundly less capable than the heavy division cavalry squadrons. The capabilities of the reconnaissance squadrons are adequate, so long as the commanders of the new modular brigades never expect their reconnaissance squadrons to do more than their old BRTs were expected to accomplish. Unfortunately, the demands and expectations for what the brigades will do in the future, supported by sixty-five years of empirical historical evidence, seem to strain this logic. With his combat power now

reduced by one maneuver battalion, commanders of new modular brigades are more likely to compel their reconnaissance squadrons to stand and fight at a moments notice. This is a mission well beyond the scope of the old BRTs and one that will severely test the current armored reconnaissance squadrons.

If the new modular BCTs are truly destined to replace divisions and do what divisions used to do in a hostile environment, the reconnaissance squadrons must perform the same mission sets that division cavalry squadrons used to perform. If modular BCTs are deployed to a theater alone, then their reconnaissance squadrons are even more likely to have to execute the same repertoire of missions as well as, if not better than, the old division cavalry squadrons. These taskings would likely include a complete assortment of reconnaissance and security missions ranging from simple surveillance to screen, guard, defense, patrols, raids, and a host of other offensive operations. Implied in all of this is the historically supported likelihood of these units performing a fair amount of fighting to shape and set the conditions for success for the rest of the BCT. This is simply not possible with the current tables of organization and equipment, when the tanks and helicopters are gone and the FCS is still on the drawing board. Leaders across the maneuver community owe themselves a sober moment of pause to think about just exactly what the futurists are asking reconnaissance scouts to do.

Army transformation should be focused on workable solutions for the contemporary operating environment (COE), not trading current capabilities for unproven, inadequately armed reconnaissance squadrons. The COE includes the Global War on Terror, where the enemy has a vote, soldiers fight for information every day, and creative solutions, whether new equipment or new tactics, demand the expenditure of

monetary, intellectual, and political capital immediately to guarantee their complete implementation. Two UAVs in the air, a handful of immobile ground sensors, and a smattering of Bradleys and HMMWVs are not a substitute for the capabilities of the Future Combat System, neither do they constitute a robust and durable maneuver force. The US Army has taken combat power away from cavalry organizations, in the midst of war, in favor of a notional "make contact out of contact" capability that does not exist.

Compounding the short-fall in cavalry capabilities, the modular BCTs are now minus one maneuver battalion in comparison to the old brigade design. The US Army has placed an arguably unfair burden on every BCT commander regarding the reapportionment of his available combat power. Should a commander of any modular brigade recognize that his reconnaissance squadron is not up to the task of providing security, he must then decide between one of two unpleasant options. First, the BCT commander can take assets from one of his two maneuver battalions and give it to the reconnaissance squadron. This then leaves one of his two maneuver battalions under-manned while his brigade attempts to complete its decisive operation. The BCT commander's second option is to give the reconnaissance squadron nothing, in which case he sets the conditions for the failure of his own brigade by not equipping the first element to make contact in his command with the additional assets it needs to survive and accomplish its mission.

The only organizations thus far to have demonstrated any degree of sophistication in achieving new ISR capabilities are the Stryker brigades, but their successes are not yet qualified as functional in a high intensity conflict. Much of the Stryker RSTA squadrons' battlefield successes have manifested themselves exclusively inside the stability and

reconstruction operations environment of OIF. The majority of these achievements have been in the area of street level interaction, all of which weighs heavily on the unique HUMINT gathering abilities of the Stryker brigades. Unfortunately the presence of these HUMINT gatherers and linguists is personnel intensive and seems to be completely absent in the current configurations of the other new reconnaissance squadrons in the HBCTs and IBCTs. In the non-Stryker equipped reconnaissance squadrons, the army not only lacks the promised multitude of sensor systems, but it also lacks sufficient numbers of the most important system of all, the American soldier. The US Army seems to have been promised a great deal with these reconnaissance squadron concepts and has been delivered very little so far. Senior leaders should be cognizant that soldiers may suffer in combat because of it.

In light of the recent transformations occurring throughout the US Army, some discussions have surfaced regarding the true nature of the cavalry mission. The armor and cavalry community is currently asking itself a set of tough, soul searching questions. Are the new reconnaissance organizations armed with enough firepower to act as a maneuver element? Are the current reconnaissance platforms in the Army survivable enough? Are the current reconnaissance platforms in the US Army, to include the Stryker reconnaissance variants, adequately armed to deal with enemy threats? If the army accepts the lighter cavalry concept, then what is the core competency of cavalry, reconnaissance or security? Unfortunately, there seems to be a rising trend, unsupported by the weight of historical evidence, calling for reconnaissance to become the sole core competency of cavalry. This is a dangerous premise from which to begin any serious debate, yet this was precisely how the transformation movement began.

In the late 1990's, then Army Chief of Staff, General Eric Shinseki, warned his subordinates flatly, "if you don't like change, you're going to like irrelevance a lot less."[7] Unfortunately, what may have begun as simple impetus for gradual change seems to have been hijacked by self-proclaimed visionaries who perceive a need to abandon everything associated with the Cold War military, no matter how successful, in favor of a revolution in military affairs toward light, agile, and joint responsiveness. Much of what has been accomplished so far in the redesign of the US Army's new reconnaissance squadrons resembles this line of thinking. Major Bryan Mullins states in the body of his monograph, *Defining the Core Competencies of US Cavalry* that "Cavalry visionaries need to stop defending the heavy squadron and regiment…and start considering answers to [reconnaissance] questions if they want to be relevant within the next five years."[8]

Suddenly, without even demonstrating that these new, experimental reconnaissance organizations will even work, the advocates of new cavalry are morally ascendant and the proponents of the older organizations need to just simply adjust their negative attitudes. Additionally, Mullins drives his thesis by proposing "conclusion(s) and recommendations [that] suggest methods to reduce…institutional and organizational resistance to embracing the new face of cavalry in the US Army."[9] Mullins' focus seems to presume that the immediate transformation of cavalry to exclusively reconnaissance roles is a *fait accompli* and the stiffest obstacle to modernization is merely overcoming skepticism, rather than the more urgent and immediate requirement to simply demonstrate these new concepts will even work with our existing technologies. To the futurists, the intellectual intransigence of experienced armor and cavalry leaders is

labeled the chief obstacle rather than the empirical evidence of sixty-five years of hard won lessons on the battlefields of Europe, Vietnam, North Africa, and Southwest Asia.

Joint Staff experts go on to define the future of war antiseptically as Network-Centric Warfare (NCW); "an information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision makers, and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization."[10] Without explaining how NCW plans to answer the still very real requirement to kill an equally capable, thinking, adaptive enemy, the NCW advocates simply keep hammering away at how this extraordinary technological superiority is the ultimate end in itself. "According to [their] definition, it is our asymmetric strength that really matters, not the enemy's asymmetric ability to avoid the effects of that strength."[11] The new reconnaissance organizations are alleged to fit into this plan nicely with a multitude of sensors and a reliance on digital command and control to direct shooters outside of the squadrons to come do the killing. Recent FCS concepts discuss the gradual "spiral development and implementation" of new sensor system platforms and command and control vehicles as they become available, ultimately leading to complete FCS fielding in the coming decades.

The problem with the NCW concept is that it completely discounts three very real liklihoods of any future war. First, any deliberate electromagnetic interference created by the enemy, such as a broad band frequency jamming or a single nuclear electromagnetic pulse (EMP) can make NCW difficult to impossible to achieve. Secondly, poor weather, terrain interference, and well concealed enemy forces can make sensor observation and

stand-off impossible to achieve, forcing soldiers to fight for information, much the same as they have for the last 2000 years. Finally, NCW concepts seem to also assume away much of the human dimension; their primary assumption is that any potential enemy would attempt to stand and fight conventionally and not seek asymmetrical methods to offset our advantages. This would allow the United States to leverage these wonderful new systems exactly as it wishes. This is a dangerous assumption and seriously underestimates the intellect of potential adversaries.

As the US Army is already witnessing in Iraq, an enemy unwilling or "unable to confront us on our own terms, [will] focus instead [logically] on exploiting our weaknesses."[12] Any action the US Army takes will generate an immediate, adaptive response from a thinking enemy. Over-reliance on NCW will surely encourage adversaries to seek low tech and evasive tactics that force Americans to step away from their computer screens and out of their vehicles. For this reason, the US Army must remain ever vigilant against assuming away the need to retain traditional skills, methods, and capabilities of killing the enemy up close and personal. NCW has its merits and will certainly bring welcome enhancements and combat enablers to the table, but it is dangerous to assume it will answer all of the army's needs.

As this study has shown in the previous two chapters, the idea that reconnaissance can be the sole, central purpose of why cavalry exists and that security missions are therefore separable from cavalry missions is an absurdly false premise. The ahistorical central argument of this notion is that reconnaissance is never a part of security. Conversely, these recon-centrists assume security is never at least a partial purpose for why maneuver organizations might conduct reconnaissance in the first place.

Additionally, the reconnaissance-only proponents believe that to increase reconnaissance capabilities, one must give up security as if the two were mutually exclusive concepts. In their eyes, to include security tasks is to dilute the attention paid to important reconnaissance tasks. To that end, the new reconnaissance squadrons have radically narrowed their focus to but a small group of mission sets within the old cavalry paradigm, as show in the unshaded portion of table 2.

Table 2. Reconnaissance Divorced from Security: The Realignment of Roles and Missions for Modular Reconnaissance Squadrons.

Current Reconnaissance Squadron Missions and Capabilities

Roles	**Reconnaissance**	**Security**	**Economy-of-Force**
Mission Sets	Route Recon	Area Security	**Offensive (Movement to Contact, Hasty Attack, Deliberate Attack)**
	Zone Recon	Convoy Security	
	Area Recon	Screen	**Defensive (Defend in Sector, Defend a Battle Position)**
	Reconnaissance-in-Force	**Guard**	
		Cover	**Retrograde (Delay)**

Note: Guard mission capability is possible for reconnaissance squadrons with additional combat power augmentation

The ultimate aim of transformation efforts, as outlined in Major Louis Rago's monograph "Cavalry Transformation: Are We Shooting the Horse Too Soon?" is therefore to diminish the role of RSTA to the point where it only answers intelligence, surveillance, and reconnaissance requirements and never performs security.[13] Major Rago also succinctly outlines how these questionable assumptions are proposed inside the *Objective Force*, whitepaper.

> First, future technological means will provide accurate, relevant information in the vast majority of situations without requiring aggressive reconnaissance or

> further development of the situation. Second, economies of force will not be necessary since secondary efforts will be avoided through situational understanding and enhanced mobility. Lastly, dominant situational understanding drastically, if not completely, eliminates the need for forces undertaking the traditional security mission. The current Objective Force Concept postulates that, upon completion of transformation, the traditional cavalry roles of security and economy of force will become inherent functions of the "system-of-systems." Nevertheless, the role of reconnaissance will continue, with a more narrow scope, as the primary task set for the inheritor of cavalry – the Objective Force ISR element.[14]

Much as the US Army focused its armored cavalry organizations at the beginning of World War II only on reconnaissance, those advocating this line of thinking today seem to demand an identical radical narrowing of focus. The reconnaissance only advocates go further by wishing away security missions with little acknowledgment toward the weight of historical evidence that loudly contradicts this opinion. Major Mullins, in his core competency monograph, seems to propose that, if serious thinkers and decision makers in the US Army could just admit that reconnaissance is cavalry's only core competency, they could easily adapt the focus of cavalry units to reconnaissance and give away security missions and the economy-of-force role to nearly any random maneuver asset. Who the US Army chooses to appoint as this random security force becomes another difficult question, when one considers the lack of available combat power created by stripping the new BCTs from three down to only two maneuver battalions.

From the beginning of the debate, pure reconnaissance advocates possess a fundamental flaw in their logic. In describing reconnaissance as the only core competency of cavalry, they have constructed an illogical ahistoric argument. As this study has shown, reconnaissance operations over the last sixty-five years have never occurred in a vacuum. Certainly there are times when a cavalry organization may perform

missions with more tasks residing in the realm of reconnaissance than in the security, but as history has repeatedly shown, reconnaissance missions are seldom, if ever, completely divorced from security missions. Yet, in spite of this overwhelming historical evidence, this is exactly what the reorganization efforts for the new reconnaissance squadrons have achieved. The US Army has attempted to divorce reconnaissance from security, forced its cavalry units to abandon all of their capability to fight for information, and optimized them instead to perform the historically least conducted mission set; that of pure reconnaissance. Unfortunately, the successes of cavalry units throughout the last sixty-five years completely contradict these assumptions. History clearly demonstrates that cavalry units must be equipped, trained, and led to accomplish both reconnaissance and security missions precisely because this is what being out in front means.

Those scouts out front, who survived to continue to lead from the front, did so by retaining, as a minimum, the flexibility and robust capabilities needed to cope with a broad range of missions and threats. When confronted with historical evidence that cavalry requires a minimum level of firepower and protection, the most common reply by futurists is to redirect the argument by demanding modified training and changes in how the US Army supports reconnaissance units.[15] Sadly, there doesn't seem to be much elaboration on what retraining and supporting differently actually means. The recently revised reconnaissance doctrine manuals certainly have not made this dismissive logic any clearer. Chapter Three of FM 3-20.96 describes a battlefield where joint precision fires are critical to the survival and effectiveness of the reconnaissance squadrons, yet it suggests nothing on how the US Army is to train and sustain this joint fires relationship while units are in garrison. While the synchronization of training between maneuver units

and fires battalions might be a common occurrence at home station, the daily tasking of US Airforce, Navy and Marine Corps aviation is not. Short of stationing a wing of A-10s, F-16s, F-18s with each reconnaissance squadron, the idea of conducting routine exercises between sister services in order to develop the skill sets necessary to implement this new doctrine is currently a foreign concept.

Some recent observations at the US Army Armor School provide additional insight into some of the flaws in the current RSTA concept. In several recent simulations in the Close Combat Tactical Trainer, during the fiscal year 2005 Cavalry Leaders Course at Fort Knox, both students and instructors attempting to train to fight differently realized the problems with survivability possessed by the new HBCT reconnaissance squadrons. Frequently students faced two distinct challenges, whether conducting reconnaissance or security missions**.** First, always making first contact on its own terms was consistently difficult for the reconnaissance squadron to achieve. A failure by a UAV or other sensor to detect the presence and disposition of an enemy threat prior to closure with a ground cavalry troop left the discovery learning to a HMMWV or Bradley making physical contact. With no tanks or organic aviation assets, there is little imbedded firepower in a reconnaissance squadron, save for the twenty-one Bradley Fighting Vehicles spread across the entirety of the organization. Though not a small amount of firepower when compared to a BRT, these roughly two companies of Bradleys fall far short of what the old division cavalry squadrons brought to the fight to accomplish the same missions. This was a critical vulnerability that routinely allowed between 25-40% casualties in every mission, because the reconnaissance squadrons simply could not survive first contact with direct fire, nor could they shoot their way out of a bad situation.

The second problem manifested itself when squadron staff officers and commanders consistently left the reconnaissance squadron in direct fire contact too long. Cavalry Leaders Course (CLC) students continuously wrestled with when to call for the commitment of the combined arms battalion (CAB) following in support. A failure to make the timely read on a predetermined decision point for execution of a battle handover proved to be a critical point of friction. Whether the reconnaissance squadron transitioned its fight over to a cross-attached tank company or handed the fight over to a CAB assigned to follow and support, students in CLC discovered that their decision points triggering battle handover had to be ruthlessly enforced. Missing a window of opportunity, sometimes lasting only seconds, cost them more than just a chance to take advantage of an enemy weakness; they lost scouts and expensive sensor systems they could not quickly regenerate. The lack of protection and firepower present in the reconnaissance squadron placed the entirety of the unit's survival resting on the ability of the staff to make the perfect read on the enemy every time. This is an unreasonable demand to place on the shoulders of even the most experienced commanders and staff teams, let alone CLC students, and would become even more problematic when factors of fatigue, weather, and other battlefield stressors were added to the equation.

Ultimately, without robust platforms, such as tanks, attack helicopters, and scout aviation that will allow survival from the moment of first contact, reconnaissance units will not last long on the battlefield of the future. Without the firepower required to at least fix the enemy in place while the combined arms battalions move, find and support, out of necessity, Bradleys and HMMWVs will be forced to sacrifice themselves until help arrives. This was the clearly demonstrated result of all twelve exercises conducted at

the Cavalry Leaders Course from January through April 2005. The implication of these observations for RSTA combat in the real world is noteworthy, as friction and the fog of war are typically only more amplified once outside the tidy realm of virtual simulations. The time has come to make to fix these new organizations before the army is forced to validate these findings with actual casualties.

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[1] Eric K. Shinseki, General, *United States Army White Paper: Concepts for the Objective Force* (Washington, DC: Department of the Army, November 2001), 6.

[2] United States Army, *7th Squadron, 10th Cavalry Revised MTOE Structure*. (Fort Knox: Armor Captains Career Course, 11 February 2005) [electronic presentation]; available from the Armor Captains Career Course.

[3] Joseph McFarlane, 1SG. Telephonic Interview, 12 January 2006.

[4] United States Army, *ISR Organizations and Assets.* (Fort Knox: Armor Captains Career Course, 1 May 2004) [electronic presentation]; available from the Armor Captains Career Course.

[5] Williamson Murray and Robert Scales. *The Iraq War: A Military History* (Cambridge, MA: First Harvard University Press, 2003), 239-240.

[6] Nathaniel R. Helms, "Where's the Beef?" *Defense Watch Online,* 11 October 2005 [journal on-line]; available from http://www.sftt.org/; Internet Accessed 21 October 2005, 6.

[7] Peter J. Boyer, "A Different War." *The New Yorker Online,* 2 April 2003 [article on-online]; available from http://www.newyorker.com/archive/content?030407 fr_archive04; Internet Accessed 1 Feb 2006.

[8] J. Bryan Mullins, MAJ, "Defining the Core Competencies of US Cavalry" (Monograph, US Army Command and General Staff College, School of Advanced Military Studies, 2004), 73.

[9] Ibid., 3.

[10] Frederick W. Kagan, "War and Aftermath." *Policy Review, No. 120 Online*, September 2003 [journal on-line]; available from http://www.policyreview.org/aug03/ kagan_print.html; Internet Accessed 16 May 2005.

[11] Alfred Kaufman, "Caught in the Network," *Armed Forces Journal* 142 (February 2005): 20-22.

[12] Ibid., 21.

[13] Louis B. Rago, MAJ, "Cavalry Transformation: Are We Shooting the Horse Too Soon?" (Monograph, US Army Command and General Staff College, School of Advanced Military Studies, 2002), 38.

[14] Ibid., 39.

[15] Gregory Fontenot, et al., *On Point: The United States Army in Operation Iraqi Freedom* (Washington, DC: Combat Studies Institute Press, 2004), 423.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS FOR DOCTRINE, NEW TERMS, AND FORCE STRUCTURE

As this study has demonstrated, all of the historical evidence points to one conclusion; modern cavalry has to have the mobility, range, firepower, and protection, to survive first contact, report, and develop the situation. Cavalry organizations throughout history, and especially today, retain the need to be multi-capable in order to perform a variety of missions beyond just simple reconnaissance. Wishing away the hardships of modern battlespace with a UAV tasking matrix and a rain check for the FCS is not a satisfactory answer, when poor weather, restrictive terrain, and an uncooperative enemy consistently still have a vote. Given the true nature of cavalry operations demonstrated in this study, the issue should not be deciphering how to reconstitute reconnaissance as the only core competency of cavalry. The central question should actually be whether or not the US Army has adequately equipped its new RSTA organizations to handle more than just reconnaissance missions. Senior leaders recently visiting the Command and General Staff College in 2005-2006 have commented that transformation toward modularity continues, but the one glaring deficiency in the new brigades continues to be the reconnaissance squadron. The contemporary operating environment demands that the US Army address this issue, because cavalry units, in spite all the best intentions to avoid direct combat, are being asked to perform more across the full spectrum of combat operations in Iraq today.

In the effort to find effective solutions to the challenge of transforming cavalry units, conclusions and alternatives that contradict the historical realities exposed in this

study must be rejected. Those advocating the complete extermination of traditional cavalry units appear to boil their arguments down to two basic recommendations. First, the army should convert all existing cavalry units into reconnaissance specialists. Second, they advocate preparing every other maneuver unit in the US Army to become security generalists.[1] These proposals, however, possess several flaws in logic. These fallacies appear to stem from either a failure to recall the overwhelming weight of historical evidence that contradicts their assumptions or a failure to grasp recent evolutions in ISR doctrine.

The first fallacy suggests specializing cavalry in only reconnaissance missions to preclude its use as a maneuver force. The advocates of this philosophy are convinced that equipping cavalry with anything beyond modest direct combat capabilities is an over-endowment.[2] The proponents of this course of action suggest "purposely building stealthy reconnaissance forces that are supported by external combat forces…with a minimal amount of organic combat power," because "any reconnaissance element strong enough to fight for effective information is often strong enough to be assigned other combat missions."[3] The critical flaw in this train of logic is that it posits the notion that the central cause of cavalry's commitment to the direct fight is temptation, not the historically supported cases of battlefield necessity. By stark contrast, this study has conclusively demonstrated that the average commander committing his cavalry to the direct fight in the twentieth century was doing so because the enemy and other desperate circumstances dictated it.

The second fallacy of the movement toward weaker reconnaissance organizations seems to assume that most maneuver organizations are no longer good enough to execute

reconnaissance and surveillance. The army, therefore, needs to specialize cavalry to exclusively perform reconnaissance missions.[4] However, recent changes in US Army doctrine suggest a different perspective on the future of ISR. The trend seems to be actually moving away from reconnaissance specialists and toward a widening of ISR collection responsibilities across the force.

The latest ISR concepts, especially in light of recent experiences in OIF and OEF, declare that everyone on the battlefield now conducts reconnaissance, and everyone has a contribution to make throughout the entire ISR process. US Army Training and Doctrine Command (TRADOC) describes this concept as "Every Soldier a Sensor" (ES2).[5] Rather than focusing on just traditional ISR assets, every soldier is now a collector, and to that end, everyone has a role to play in confirming or denying the commander's priority intelligence requirements. The days of cavalry scouts retaining the exclusive domain over reconnaissance are over, and this trend only promises to become more prevalent as digital networking pushes its way down to the individual soldiers' helmets and headsets.

Additionally, one of the most highly touted abilities used to support the RSTA concept from the beginning was the capability to conduct reconnaissance and target handover, with multiple sensors that pull "the shooters" to the right place, at the right time to destroy the enemy (see figure 13). [6] Target acquisition can now just as easily be the purpose behind a surveillance mission rather than simply gathering information. This concept is clearly not just pure reconnaissance, but an active target acquisition and engagement hand-off process; thus, the RSTA acronym. This target acquisition and hand off process is clearly a blend of both reconnaissance and security missions, that maximizes the best attributes of emerging sensor technologies and precision engagement

capabilities. This concept is an evolutionary step in how the army kills targets while conducting a screen or guard mission. It certainly does not appear to be a move toward any exclusive reconnaissance focus, as this process still requires aggressive movement to reposition sensor assets and still retains the requirement for RSTA units to fight as needed until a maneuver battalion can assume control of the fight.

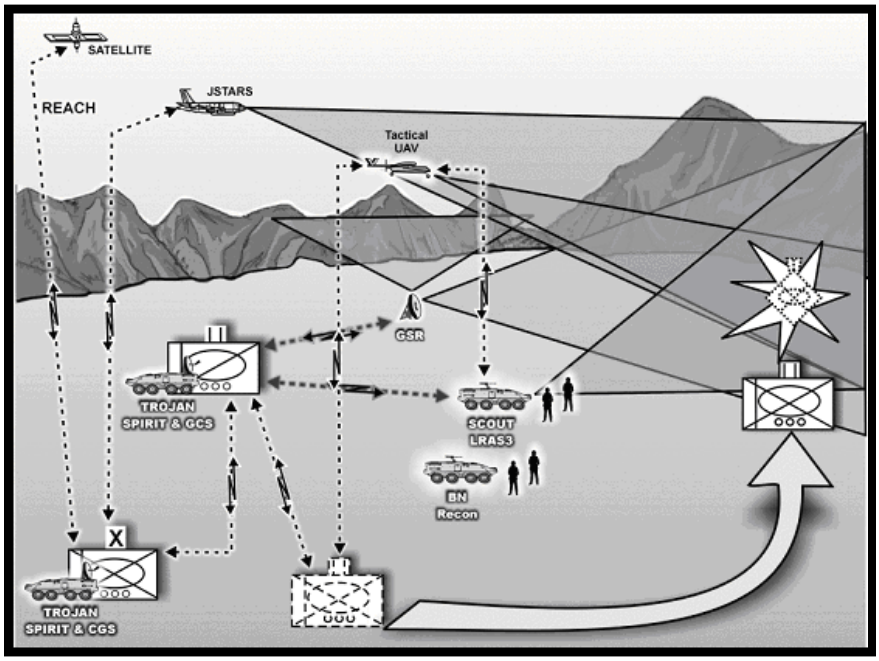


Figure 13. The RSTA and Battle-Handover Concept
Note: At the theoretical moment of decisive action shown above, multiple RSTA assets pull a supporting maneuver battalion to a spot on the ground, at a carefully chosen time and space, to complete the destruction of the attacking enemy battalion.

Source: United States Army, FM 3-20.96, *Cavalry Squadron (RSTA)* (Washington, DC: Department of the Army, 2002), 3-47.

The third fallacy pushed by some futurists is that security no longer requires the specialization of cavalry units to execute, as they allege that nearly any battalion or brigade combat team can be tailored and trained to execute these missions.[7] Ironically,

many who suggest this course of action repeatedly admit the necessity of changing the specific task organization, METL, and training resources of these generic units just to enable them to perform these security missions adequately. Essentially, in order for the US Army to create specialized reconnaissance units, it will have to designate specialized security units from existing BCTs and combined arms battalions, which will logically require time and significant reorganization. To assume away the logistical, training, and time requirements behind this reorganization process is to risk assigning security to hastily organized task forces who neither understand the complexities of security nor are comfortable working with those recently assigned units with whom they have little experience.

This hard reality, supported by decades of historical evidence, then begs the question: Why eliminate division cavalry and armored cavalry regiments, if the army will just be forced to recreate specialized battalions and BCTs to do the exact same METL tasks all over again? All the army would accomplish with this solution is harassment of existing cavalry organizations, like the 3rd Armored Cavalry Regiment (ACR), by making them stand down and go away, only to, at some later date, tell some other similar sized unit to reorganize, change its METL, and train up to go perform the security missions that division cavalry and the ACRs used to perform. It is a shameful waste of time and effort and smacks of a hidden agenda to exterminate cavalry culture rather than simply improve how the US Army fights.

The fourth fallacy suggests that commanders cannot be trusted to use their cavalry assets for just reconnaissance if you give these organizations too much firepower.[8] Not only is this insulting to the intellect and discipline of every battalion and brigade

commander now serving in the Army, but the recent history exposed in this study gives numerous examples where reconnaissance units were told to fight anyway, regardless of their limitations and lack of firepower, and despite the protestations of their commanders. The enemy has a vote and battlefield circumstances change in ways that often force the commander's hand.

The balance of any thorough historical argument and the weight of twentieth century evidence, especially since 1936, seem to favor the need to give cavalry organizations more rather than less. Cavalry has almost always been told to do more than just simple reconnaissance out of necessity. These additional assets would seem to suggest not only including more sensor systems to enhance reconnaissance, but including new vehicles with additional firepower and protection, and perhaps, as in the case of operations in Iraq (OIF) and Afghanistan (OEF), attaching multifaceted subunits capable of enabling stability and reconstruction operations over wide areas.

Recommendations: So What Can the Cavalry Force Do Now?

Advocating a divorce between cavalry and armor, in order to focus cavalry exclusively on reconnaissance, is a huge mistake and is missing the central point of creating RSTA units in the first place. RSTA units were designed, in their initial concept, with the assets and doctrine needed to both collect intelligence at multiple levels and, at the same time, always remaining prepared "to detect an enemy out of contact and defeat him with a wide selection of options"[9] by directing other units with the firepower necessary to do the dirty work. Detecting the enemy, pulling combat power to the right spot, and killing him describes the very synthesis behind target acquisition.

Just because a cavalry unit is no longer capable of standing at the decisive point of the battle, directly executing the operation that ultimately completes the destruction of an enemy force, does not mean that it will not be involved as a shaping force that routinely conducts battle handover. Through the use of direct fires, precision munitions, and the carefully timed arrival of combined arms battalions and other battlefield operating systems, reconnaissance squadrons are expected to and will get told to stand and fight within their capabilities. This is written into the latest field manuals, such as FM 3-90.96, *The Reconnaissance Squadron* and FM 3-20.971, *Reconnaissance Troop.* For this reason, it is unlikely that any concept of pure reconnaissance, at the exclusion of security, will ever take hold. The Pentagon can make cavalry as light as it wants it to be, but it will always find itself both fighting to survive while it waits for help and habitually integrated in the process of acquiring the enemy, shaping the operation, and setting him up for the kill. The US Army should close the lid on this faulty, exclusive reconnaissance logic and move on to learning how to fight these new units in both reconnaissance and security missions to the best of their capabilities.

If the US Army is eventually forced to focus its cavalry branch METL exclusively on reconnaissance, there are several issues must then be answered. First, it must answer what reconnaissance ground troops do to find the enemy, when the paltry number of UAVs and sensors currently available in reconnaissance squadrons cannot fly or see. Second, until the FCS technology and organizations to matures, what will scouts who make direct contact with the enemy do when they cannot break contact or effectively call someone in who actually possesses the firepower to bail them out? Third, until the FCS achieves full fielding in a decade or so, how will reconnaissance squadrons achieve the

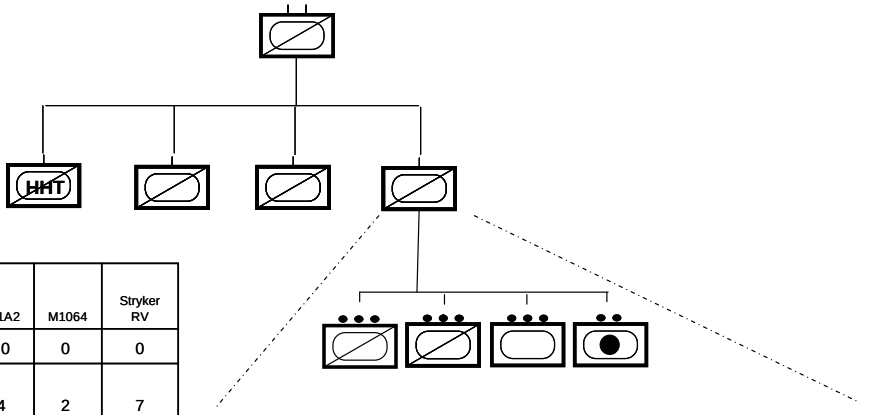
promised multidimensional, complimentary, and redundant sensor capability the coming FCS promises? Even the best equipped of the current BCTs possess only immobile, inflexible, and underperforming systems that currently stand in for the Future Combat System's extraordinary sensor troop concepts. Fourth, what will the new HBCT and IBCT squadrons do when they are not even given the interim sensor troops they were originally supposed to have, as depicted in Chapter Four of this study? Fifth, what should the HBCT and IBCT reconnaissance squadrons do to replicate the HUMINT gathering and linguist capabilities imbedded within the Stryker RSTA squadrons, but currently non-existent in the recon squadrons' MTOE? The presence of these assets is of enormous reconnaissance value, particularly in OIF and OEF environments, but they do not appear in the new HBCT and IBCT reconnaissance squadrons' MTOE. The US Army urgently needs to address the weaknesses of its new cavalry organizations now. If the army will not completely reverse the trend toward light reconnaissance, it must at least fix the new organizations it is forced to accept now, in order to realistically meet the demands of the modern battlefield.

In light of the weaknesses of the new reconnaissance squadrons exposed in this study, it would behoove the US Army to consider some of the following modest proposals. As both the M1025/26 Scout HMMWV and its cousin, the M1114, lack mobility in some types of terrain and survivability in nearly all hostile environments, the army should consider replacement with either the Stryker reconnaissance vehicle or an existing variant of the Marine Corps LAV 25. Marine variants or an updated version of the Canadian Coyote would provide an immediate, off-the-shelf, platform to fulfill this role. Not only are the LAV and Stryker more survivable and better armed, but they are

also quieter on the move than most HMMWVs. Either option gives the US Army better than what it has now in all three realms of mobility, firepower and protection.

In addition to the need to replace the Scout HMMWV is the need to provide heavier firepower for modular reconnaissance units. As this study has shown in its previous chapters, the requirement to fight for information against the full spectrum of threats remains both real and persistent. As the new modular brigades only currently possess two maneuver battalions, the likelihood of a reconnaissance squadron standing and fighting, at least in an economy-of-force role, has increased. To make matters worse, until the UAVs and other sensor systems that are so critical to the success of the FCS concepts exist in large numbers, the standoff required for reconnaissance squadrons to avoid attrition in direct fire contact is not yet a reality. Given the current situation, the reconnaissance squadrons should logically therefore be reassigned firepower heavy enough to handle the direct fire workload. Unfortunately, reallocating any combat power within the new BCTs runs up against the same limitations that gave these brigades only two maneuver battalions in the first place. The same shortage of equipment and personnel that occurred as a result of stretching the army to forty-three or forty-eight brigades will also impact any effort to increase the combat power of any one of their subordinate organizations. Option One illustrated in this chapter depicts one possible solution that calls for a very modest increase in troops and equipment (see figure 14).

Proposed HBCT Reconnaissance Squadron Structure
Option One (CFVs, Tanks, Strykers)



Squadron Roll Up	CFV	M1A2	M1064	Stryker RV
HHT	2	0	0	0
Recon Troops x3	7	4	2	7
Totals	23	12	6	21

Recon Troop Roll Up	CFV	M1A2	Javelin	M1064	Stryker RV (w/LRAS)
HQs	1	0	1	0	1
Recon Platoon x2	3	0	3	0	3
Tank Platoon	0	4	0	0	0
Mortar Section (120mm)	0	0	0	2	0

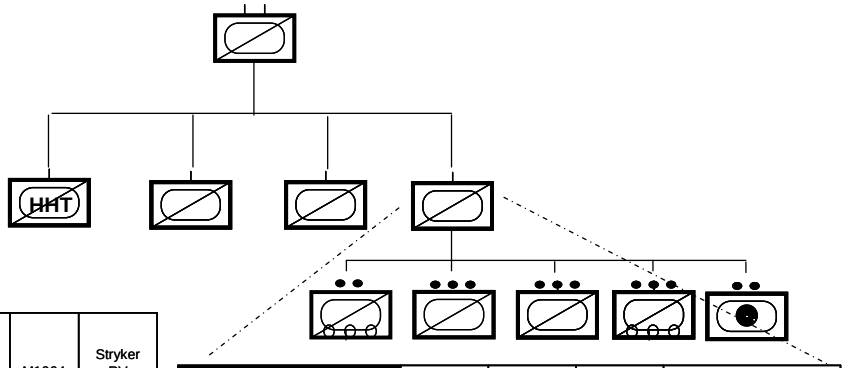
Figure 14. Option One: Adding Tanks and Strykers

The proposal in figure 14 has several advantages over the current HBCT reconnaissance squadron. For a modest increase of about twenty soldiers and four Abrams tanks per cavalry troop, the squadron gains the ability to fight and survive until the BLOS and NLOS capabilities of the FCS actually arrive over the next decade. For the modest cost of upgrading two towed 120-millimeter mortars and their HMMWV prime movers in exchange for two M1026 mortar carriers, the troops would require no additional personnel but would gain the ability to actually conduct indirect fire missions while mounted, greatly enhancing responsiveness and available troop level firepower. Finally, this proposal calls for the direct substitution of twenty-one Stryker Reconnaissance Vehicles to replace the thirty M1114 HMMWVs currently assigned to the squadron. This would solve the mobility limitations, visibility issues, and

survivability problems of the up-armored HMMWV evident since 2003. The HMMWV was never originally designed to be a dedicated armored fighting vehicle, and recent efforts to transform it into such a role in OIF have only served to illustrate its inadequacies. It is not an ACAV, and it is time to stop trying to force it to become one.

A second option, if deployability is still a concern, is to trade Bradleys away in favor of Strykers armed with 30mm weapons systems and replace HMMWVs with M113A3s. The M113A3 platforms could be upgraded to ACAV configuration or even be upgraded to a Bradley turret, much as the 11th Armored Cavalry Regiment at Fort Irwin has configured their OPFOR Surrogate Vehicles. Option Two, shown in figure 15, has the advantage of increased flexibility for strategic deployment and enhanced survivability over the HMMWV equipped squadrons. Unfortunately, it still lacks a robust tank killing capability and shares the Stryker RSTA squadron's vulnerability to anti-armor threats.

Proposed HBCT Reconnaissance Squadron Structure
Option Two (ACAV and Stryker)



Squadron Roll Up	M113 ACAV	M1064	Stryker RV
HHT	0	0	2
Recon Troops x3	10	2	8
Totals	30	6	26

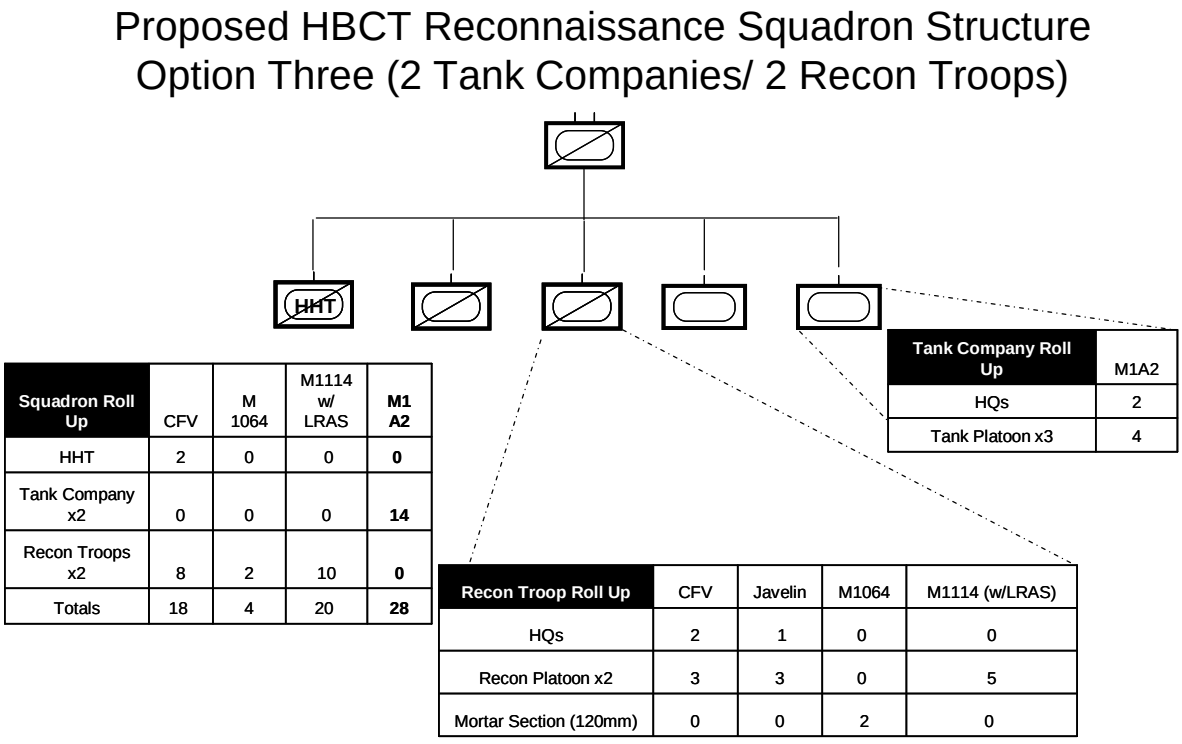
Recon Troop Roll Up	M113 ACAV	Javelin	M1064	M1114 (w/LRAS)
HQs	0	1	0	2
Recon Platoon x2	5	3	0	3
Mortar Section (120mm)	0	0	2	0

Figure 15. Option Two: A Modest Increase in Capability with ACAVs and Strykers

Of course, any option still must optimize operational deployability with the requirement to field tracked and wheeled vehicles that can fight and survive. However, with the recent announcement by Secretary of the Army Francis Harvey that the FCS no longer retains a C-130 air transportable requirement, there is no remaining deployability advantage to the FCS.[10] It is interesting to note that the collapse of the very central strength of the FCS, trumpeted by its proponents as a superior alternative to the heavy and strategically slow Legacy Force, has generated such little discussion in the march toward transformation. As of the first quarter of fiscal year 2006, all options for what the army now puts in its BCT reconnaissance squadrons, including retaining the M1 Abrams and M3 Bradley, should therefore remain on the table. It appears that the FCS, no matter how unique or novel is not getting to far flung battlefields any faster than the heaviest of the army's legacy platforms.

Option Three acknowledges the recent suspension of the original FCS weight limitation and takes advantage this by placing significant heavy armor back inside the cavalry squadrons (see figure 16). This option is also the least complex of the three alternative organizations proposed in this study, as it does not replace HMMWVs with Strykers, nor does it radically change the contents of the reconnaissance troops. Option three also acknowledges the new HBCT organization's biggest inherent weakness; the lack of third dedicated maneuver battalion. By giving the HBCT reconnaissance squadron a robust combat capability, brigade commanders will no longer be forced to always dedicate one of his two combined arms battalions to rescuing the reconnaissance squadron every time it runs into contact. The two major disadvantages to option three are both tied to material and personnel shortages. If the US Army has in fact created

weakened modular BCTs because this was all it could truly afford, then option three becomes null and void as a budgetary and political bridge too far.



Squadron Roll Up	CFV	M 1064	M1114 w/ LRAS	M1 A2
HHT	2	0	0	**0**
Tank Company x2	0	0	0	**14**
Recon Troops x2	8	2	10	**0**
Totals	18	4	20	**28**

Tank Company Roll Up	M1A2
HQs	2
Tank Platoon x3	4

Recon Troop Roll Up	CFV	Javelin	M1064	M1114 (w/LRAS)
HQs	2	1	0	0
Recon Platoon x2	3	3	0	5
Mortar Section (120mm)	0	0	2	0

Figure 16. Option Three: A Return to Combat Capability

If the reconnaissance squadrons are to ultimately remain as they are, then there are still significant technological promises that must be delivered soon in order to make the doctrinal concepts in the new FM 3-20.96 actually work. Reconnaissance squadrons in the HBCTs and IBCTs need the UAVs and sensors that are already present, at least doctrinally, in the SBCT RSTA squadrons. Every squadron needs these systems all the way down to troop level now, permanently, just as the FCS concept promises. Without the UAVs and other sensor systems, a RSTA squadron simply becomes an R&S

squadron, for there can be no true target acquisition and handover without the capability of projecting eyes forward beyond the scope of traditional ground cavalry capabilities. The US Army already does this in Iraq, with the total UAV count in theater, as of December 2005, at somewhere in the staggering neighborhood of 750 platforms. This number is close to 16 times what is doctrinally proposed, even in the latest versions of the reconnaissance field manuals. Facts like this seem to intuitively call into question whether anyone is capturing this reality and adapting the army's MTOE accordingly.

A Modest Proposal: Creation of a Dedicated Security Force?

> Adhoc, task-organized units drawn from the main body, untrained to perform reconnaissance and security operations, have not proven effective and only serve to reduce the amount of striking power available to the commander.[11]
>
> Colonel(R) John D. Rosenburger,
> *Breaking the Sabre: The Subtle*
> *Demise of Cavalry in the Future Force*

If the US Army truly has divorced reconnaissance from security in order to focus its reconnaissance units on just seeking out and handing over enemy targets, then it should also work to create equally dedicated security brigades or battalions, as some already have suggested.[12] Should these organizations then appear, detached from reconnaissance tasks and missions by their organization and mission assignment, then there are really only two viable options. Option one is to reform and maintain the old division cavalry squadrons as the center piece to the proposed battlefield surveillance brigade combat team (BFSB) potentially assigned to support a modular division. This would fill the division level echelon of organization with the permanent ground and aviation assets needed to give the BFSB the robust firepower it requires to be taken

seriously, should it need to perform security for the division. Continuing to show a conceptual wire chart that labels a Military Intelligence Company, a Brigade Headquarters, a Brigade Troops Battalion, and some unconfigured force to be determined later will not get the army where it needs to be with the BFSB. There needs to be an answer to what organization fills the void left by the recent demise of division cavalry squadrons. The HBCT and IBCT reconnaissance squadrons are certainly not it.

A robust security force, provided by a BFSB so organized, could then perform reconnaissance and security for the division and then hand off targets to the HBCT and IBCT reconnaissance squadrons, giving them the early warning that the absence of organic UAVs and sensors currently fails to deliver. The US Army could also equip the BFSB with additional sensors and possibly change its MTOE to look more like a heavy armored cavalry regiment squadron, depending on the level of threat expected. Lastly, the BFSB should become a permanent organization rather than the ad-hoc, disorganized task force it is currently depicted to be. This would save the army from wondering when to task organize this ad-hoc BCT, muddling another field manual trying to figure out how to train it, and then casting about for when it might be safe to actually deploy it.

The second option is to keep the 3rd Armored Cavalry Regiment exactly as it is, and designate it as the doctrinal template for the Security BCT concept. The army could then make more Security BCTs just like them; one for each corps level modular organization. The army could call them Heavy Cavalry BCTs, Cuirassiers, Modular Security BCTs, or whatever the transformation advocates have decided not to call reconnaissance squadrons or the BFSB. This course of action will definitively answer who does the guard and cover missions without burdening the reconnaissance squadrons

with security missions. It will also avoid recreating special Security BCTs ad-hoc, from standard HBCTs and IBCTs, who seldom exclusively train for this type of mission.

What the US Army can no longer do is entertain the idea that what it has right now in the reconnaissance squadrons is anything close to a workable option. Giving reconnaissance exclusively to cavalry and just randomly assigning security missions to just any battalion or BCT will not work. Security tasks are different from offense and defense at a minimum in their typical purpose; protecting someone (a friendly higher echelon organization) from something (an enemy force of some size and capability). If security were as easy as some futurists describe, a division cavalry squadron or armored cavalry regiment's ground squadron METL would look identical to any other armor or infantry battalion METL. They do not, and for very good doctrinal and historically supported reasons. Furthermore, perfecting security tactics, techniques, and procedures requires fixing a unit's task organization in place early and training the organization on how to perform security missions as often as possible. This is not something that can be done overnight, nor can the army expect a newly formed security force to perform to the degree of proficiency currently visible in our established heavy cavalry organizations such as the 3rd ACR.

Making screen, guard, cover, and other security missions a possibility for any random battalion or BCT means that every battalion and BCT will have to add these tasks to their METL out of fear that it might have the "rose pinned on it" to suddenly go perform security missions. Every organization, theoretically, could find itself burdened by learning to perform a mandatory task that the army used to only give to a specialized few. Not only does this cavalier attitude toward security missions violate sixty-five years

of history maneuver experience, but it also flies in the face of doctrine. FM 7-1, *Battle Focused Training*, describes the very purpose of why METL is important. “Battle focus is critical throughout the entire training process and is used by commanders to allocate resources for training based on wartime and operational mission requirements.”[13] There simply is not enough time for units to train to do everything. Proposing that every battalion sized maneuver unit and above prepare to perform guard and cover missions in addition to their normal METL tasks ignores current army doctrine and the realities of the garrison training environment.

Despite the flaws in many of the current transformation efforts, the new RSTA and FCS concepts are not bad ideas in and of themselves. This study does not claim that the future capabilities projected for implementation over the next twenty to thirty years are not truly positive steps in keeping the United States military the premier fighting force in the world. The linchpin in this argument rests on the necessity for all of these new systems to be fielded on time and for every one of them to function exactly as promised. If the systems existed today to assemble these technological wonders as they are supposed to look, this debate and the central arguments of this paper would be irrelevant. Unfortunately, with the abandonment of the original FCS weight requirements, one must wonder what will be the next broken promise and will it eventually affect this new system’s capabilities in combat.

The central problem in current transformation efforts is these new FCS systems do not yet exist, but the army seems to be acting as though they do. This study calls into question the wisdom of completely destroying otherwise successful cavalry organizations several years prior to the actual arrival of even the first FCS equipped brigade.

Reconfiguring reconnaissance squadrons to pretend that they can do the same thing the FCS promises to do is not a solution; it is dangerous, especially when one considers this debate from the perspective of maneuver warfare trends over the last sixty-five years. The fact that this conversion has occurred at the total sacrifice of all of the US Army's well-tested and battle-proven cavalry organizations should send alarm bells ringing throughout the maneuver community.

The central question of this study asked if the new reconnaissance squadrons are adequately equipped or organized to answer the needs of the new modular brigade combat teams. It is this author's assessment that they are not. Any future cavalry organization must retain the ability to fight for information, must be able to integrate both security and reconnaissance mission requirements, and must understand that pure reconnaissance seldom ever occurs as an isolated mission or task. The historical examples cited in this study have all demonstrated a need for cavalry units to retain the ability fight and survive through a full spectrum of operational environments. The US Army has jumped too soon in killing traditional cavalry, before it had its adequate replacement organizations, doctrine, and valid tactical concepts in place.

The US Army may ultimately succeed, in spite of itself, so long as no other army tests the United States in a large conventional conflict. Unfortunately, this logic maybe approaching the thin line between what is an acceptable risk or what constitutes a foolish gamble. The real issue here is not a lack of faith in transformation or the promise of the FCS. Advancement in warfighting capabilities is usually a good thing, but modernization should never be done at the cost of reductions in an army's current capability. The decision makers leading the United States military's transformation efforts seem to have

presumed that no near-peer competitor will challenge the US, while it spends the next twenty years experimenting. Unfortunately, should these presumptions be aggressively tested by any number of unfriendly regional powers throughout the Middle-East and Asia, all of whom still possess large, conventional maneuver forces, the United States Army may find itself seriously challenged.

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[1] J. Bryan Mullins, MAJ, "Defining the Core Competencies of US Cavalry" (Monograph, US Army Command and General Staff College, School of Advanced Military Studies, 2004), 80.

[2] United States Army, FM 3-20.96, Final Draft, *The Reconnaissance Squadron* (Washington, DC: Department of the Army, November 2005), 1-16, 1-17.

[3] Mullins, 76-77.

[4] Ibid., 78.

[5] Association of the United States Army, "ES2: Every Soldier a Sensor," *AUSA Online*, August 2004 [journal on-line]: available from http://www.ausa.org/PDFdocs /IP_Sensor08_04.pdf; Internet Accessed 4 March 2006.

[6] United States Army, FM 3-20.96, *Cavalry Squadron (RSTA)* (Washington, DC: Department of the Army, 2002), 3-47.

[7] Mullins, 73.

[8] FM 3-20.96 (November 2005), 1-16.

[9] Keith R. Walters, CPT, "The RSTA Squadron: Agile Adaptive, Relevant and Ready." *Armor*, November-December 2004, 17-22.

[10] Nathaniel R. Helms, "Where's the Beef?" *Defense Watch Online,* 11 October 2005 [journal on-line]; available from http://www.sftt.org/; Internet Accessed 21 October 2005, 1.

[11] Rosenberger, John D. "Breaking the Sabre: The Subtle Demise of Cavalry in the Future Force." *The Land Power Essay* 4, no.1, (June 2004): 9.

[12] Ibid.

[13] United States Army, FM 7-1, *Battle Focused Training* (Washington, DC: Department of the Army, 2003), 2-59.

GLOSSARY

Battlefield Surveillance Brigade. (DoD)An organization consisting of a military intelligence battalion, brigade troops battalion, an attached set of non-organic maneuver units, and a permanent headquarters tasked to conduct systematic observation of the battle area for the purpose of providing timely information and combat intelligence.

Beyond Line of Sight. A term describing a combat engagement where indirect weapons fire is normally targeted from a distance or where indirect weapons fire occurs from a position where line-of-sight to the target is not possible.

Brigade Combat Team. (DoD) A unit usually smaller than a division to which are assigned or attached groups and/or battalions and smaller units tailored to meet anticipated operational requirements. A unit consisting of two or more battalions and a headquarters.

Combined Arms Battalion. Current redesign of heavy maneuver battalions assigned to modular HBCTs in the US Army. Normally organically assigned two tank companies, two mechanized infantry companies, one engineer company, and a headquarters company.

Contemporary Operating Environment. Operational sets of conditions, world wide, where US forces confront an environment of multiple variables. These variables can include the enemy, friendly forces, noncombatants, governmental and nongovernmental organizations, neutral parties, terrain, weather, and other varied factors.

Electromagnetic Pulse. (DoD) The electromagnetic radiation from a nuclear explosion caused by Compton-recoil electrons and photoelectrons from photons scattered in the materials of the nuclear device or in a surrounding medium. The resulting electric and magnetic fields may couple with electrical/electronic systems to produce damaging current and voltage surges. May also be caused by non-nuclear means.

Every Soldier a Sensor. (TRADOC) A concept where soldiers are trained to actively observe details related to Commanders' Critical Information Requirements (CCIR) in an area of operations and competent in reporting their experience, perception and judgment in a concise, accurate manner; and, leaders who understand how to optimize the collection, processing and dissemination of information in their organization to enable the generation of timely intelligence.

Future Combat System. A joint networked system-of-systems. One large system made up of 18 individual advanced combat systems, the command and control network, and the soldier. FCS is connected by an advanced network architecture that works

to enable levels of joint connectivity, situational awareness and understanding, and synchronized operations.

Heavy Brigade Combat Team. A US Army brigade combat team transformed in accordance with the current modular configuration doctrine, equipped with mechanized combat systems.

High-Mobility, Multipurpose, Wheeled Vehicle. A light, highly mobile, diesel-powered, four-wheel-drive vehicle. Based on the M998 chassis, using common components and kits, the HMMWV can be configured to become a troop carrier, armament carrier, S250 shelter carrier, ambulance, TOW missile carrier, and a scout vehicle.

Human Intelligence. (DoD, NATO) A category of intelligence derived from information collected and provided by human sources.

Infantry Brigade Combat Team. A US Army non-mechanized brigade combat team transformed in accordance with the current modular configuration doctrine, equipped as a light infantry brigade.

Improvised Explosive Device. (DoD) A device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy, incapacitate, harass, or distract. It may incorporate military stores, but is normally devised from nonmilitary components.

Intelligence, Surveillance, and Reconnaissance. An enabling operation that integrates and synchronizes all battlefield operating systems to collect and produce relevant information to facilitate the commander’s decision making.

Intelligence, Surveillance, and Reconnaissance Assets. Those organizations, systems, sensors, personnel, and equipment dedicated to or directed toward the collection of information in response to the commander’s critical intelligence requirements.

Mechanized and Armor Combat Operations In Vietnam. A US Army research and study project commissioned during the Vietnam era to assemble and analysis data regarding mounted operations in Southeast Asia.

Mission Essential Task List. A compilation of collective mission-essential tasks an organization must perform successfully to accomplish its wartime mission(s).

Modified Table of Organization and Equipment. A modified document published by the US Department of Defense which prescribes the organization, manning, and equippage of units from divisional size and down, but also including the headquarters of corps and armies. It also provides information on the mission and capabilities of a unit as well as the unit's current status. Because it is modified, the table usually specifically addresses one particular unit or organization.

Network Centric Warfare. An information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision makers, and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization.

Near Line of Sight. A partially obstructed path between the location of an observer or transmitter and the location of a target or signal receiver. Obstacles that can cause an obstruction in the line of sight include trees, buildings, mountains, hills and other natural or manmade structures or objects.

Remote Battlefield Sensor System. An unattended ground sensor system that detects, classifies, and determines direction of movement of intruding personnel and vehicles.

Reconnaissance, Surveillance, and Target Acquisition. (JP 5-0) Tactical RSTA operations provide required detailed information (i.e., terrain, enemy disposition, orders of battle, movement, offensive and defensive capabilities) needed to plan and to employ combat forces successfully. This support includes providing target detection and acquisition, near real time intelligence, that provides opportunities for offensive and defensive actions and help reduce casualties and achieve victory.

Sonderkraftfahrtzeug. Military special purpose vehicle; German Wehrmacht usage, obsolete in current German Bundeswehr doctrine.

Stability and Reconstruction Operations. (DoD) Operations other than combat operations that involve violence or the threat of violence and can come in various sizes and forms. Examples of stability operations are rebuilding institutions such as security forces, correctional facilities and judicial systems; reviving or building the private sector, including encouraging citizen-driven economic activity and building necessary infrastructure; and developing representative governmental institutions, according to the directive.

Stryker Brigade Combat Team. A US Army brigade combat team equipped with the Stryker eight-wheeled, medium-weight family of combat vehicles. Point of origin for the US Army's current modular configuration concepts. Originally known as the Interim Brigade Combat Team. Equipped primarily as a motorized light infantry brigade with various enabling sensors and digital command and control systems.

Tactical Air Control Party. (NATO) (DoD) A subordinate operational component of a tactical air control system designed to provide air liaison to land forces and for the control of aircraft.

Training and Doctrine Command. US Army command responsible for recruiting, training and educating the US Army's soldiers. It develops leaders; supports training in units; develops doctrine; establishes standards; and builds the future Army.

Unmanned Aerial Vehicle. (DoD) A powered, aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely, can be expendable or recoverable, and can carry a lethal or nonlethal payload. Ballistic or semiballistic vehicles, cruise missiles, and artillery projectiles are not considered unmanned aerial vehicles.

APPENDIX A

CAVALRY AND RECONNAISSANCE VEHICLES

Selected World War II US Cavalry and Reconnaissance Vehicles

Figure 17. M8 Greyhound

Source: United States National Archives.

Figure 18. M3 Stuart Light Tank

Source: Aberdeen Proving Ground.

Figure 19. M8 75mm Assault Gun Carriage
Source: United States National Archives.

Figure 20. M24 Chaffee
Source: United States National Archives.

Selected World War II German Reconnaissance Vehicles

Figure 21. German SdKfz 222 Light Armored Car
Source: Major Doug Thornton, 2006.

Figure 22. German SdKfz 232 Eight-Wheeled Armored Car
Source: Major George Schachinger, Austrian Army.

8-WHEELED ARMORED CAR

GERMAN

s. Pz. Sp. Wg. (5 cm) Sd. Kfz. 234/2

This armored car is basically the 8-wheeled Model Sd. Kfz. 234 equipped with a 12-cylinder, 75°, air-cooled diesel engine. The armor plate on the front of the turret, superstructure, and hull is heavier than that of earlier models. The vehicle, itself, is also about three tons heavier.

The main armament consists of the 5 cm tank gun, Kw. K. 39/1, fitted with a muzzle brake. This gun has a muzzle velocity of 2,700 f/s, with A. P. ammunition. Its penetration performance with A. P. C. ammunition is estimated at 2.2 inches at 30° from 1,000 yards.

The mantlet is cast in one piece somewhat similar in appearance to that on the latest assault guns, but the casting also includes the coaxial machine gun. This design gives greater protection than the older types. The gun has a vertical sliding block and is of the semi-automatic type. A spring type equilibrator is mounted on the right hand side between the cradle and the turret top plate. The hydropneumatic recoil mechanism is mounted in the mantlet on top of the piece. Elevation is from — 7° to + 25°. Six smoke projectors are mounted, three on each side of the turret.

The front of the turret is protected by 30 mm armor set at an angle of 20° from the vertical. The sides and rear have 10 mm armor set at 25°, and the top plate is of the same thickness. The gun mantlet is rounded, and is 40 to 100 mm thick. The front of the superstructure has 30 mm armor set at a 35° angle, and the sides 10 mm at 30°. The nose plates of the hull are 30 mm thick, the upper plate being set at a 55° angle and the lower at 30°. The glacis plate is 17 mm at 70° and the sides of the hull 9 mm at 30°.

SPECIFICATIONS

Weight	11.5 tons
Length (overall with gun at 12 o'c.)	22 ft., 4 ins.
Length (overall with gun at 6 o'c.)	19 ft., 8 ins.
Width	7 ft., 10 ins.
Height	7 ft., 6 ins.
Ground clearance	1 ft., 2 ins.
Tread centers	6 ft., 4¾ ins.
Wheelbase	13 ft., 5½ ins.
Tire size	8.27 x 16
Fuel tank	89 gal. capacity
Fording depth	4 ft., 7 ins.
Speed (maximum)	50 m.p.h.
Engine	12-cylinder, 75°, air-cooled diesel. 217 BHP at 2250 engine r.p.m.
Bore and stroke	110 mm/130 mm
Ignition	Diesel
Battery	
Transmission	6 speeds forward; 6 reverse
Steering	(Dual control) worm and nut
Crew	4

Figure 23. German SdKfz 234/2 "Puma" Heavy Armored Car

Source: United States Army, *Catalog of Enemy Ordnance Material*, Chief of Ordnance. (Washington, DC 1 April 1945), 42.1

Selected US Cavalry Vehicles in Vietnam

Figure 24. US M113 Armored Personnel Carrier
Source: Donn A. Starry, *Vietnam Studies: Mounted Combat in Vietnam.* (Washington, DC: US Government Printing Office: Department of the Army, 1989), 23.

Figure 25. M113 (ACAV Variant)
Source: Donn A. Starry, *Vietnam Studies: Mounted Combat in Vietnam.* (Washington, DC: US Government Printing Office: Department of the Army, 1989), 74.

Figure 26. M48 Tanks and ACAVs Form a Defensive Perimeter.
Source: Donn A. Starry, *Vietnam Studies: Mounted Combat in Vietnam.* (Washington, DC: US Government Printing Office: Department of the Army, 1989), 76.

Figure 27. An M551 Sheridan in Service with 3rd Squadron, 4th Cavalry Regiment *Source:* Donn A. Starry, *Vietnam Studies: Mounted Combat in Vietnam.* (Washington, DC: US Government Printing Office: Department of the Army, 1989), 142.

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